CHNOLOGY DEPT.

THE PAPER INDUSTRY and PAPER WORLD

AN EDUCATIONAL NEWS MAGAZINE—JANUARY, 1943

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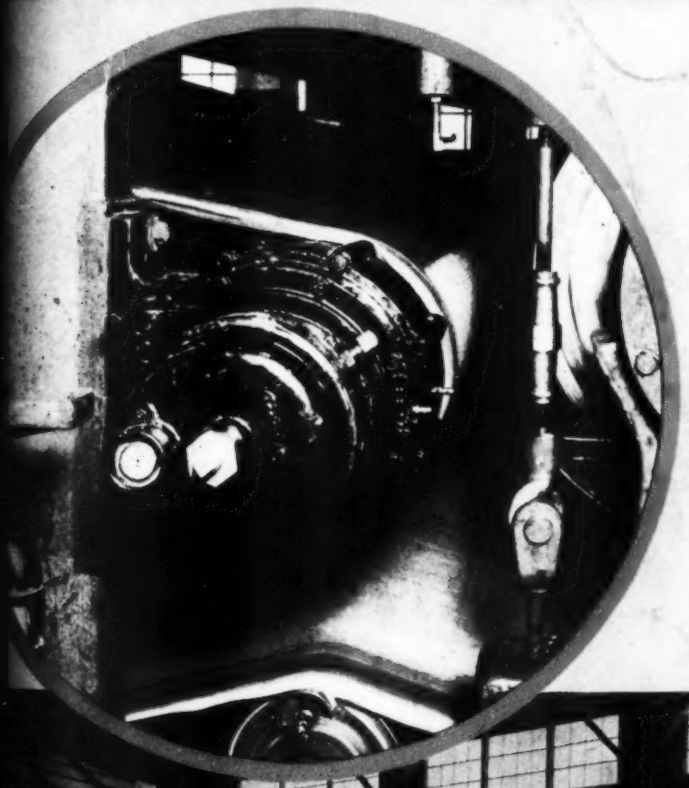
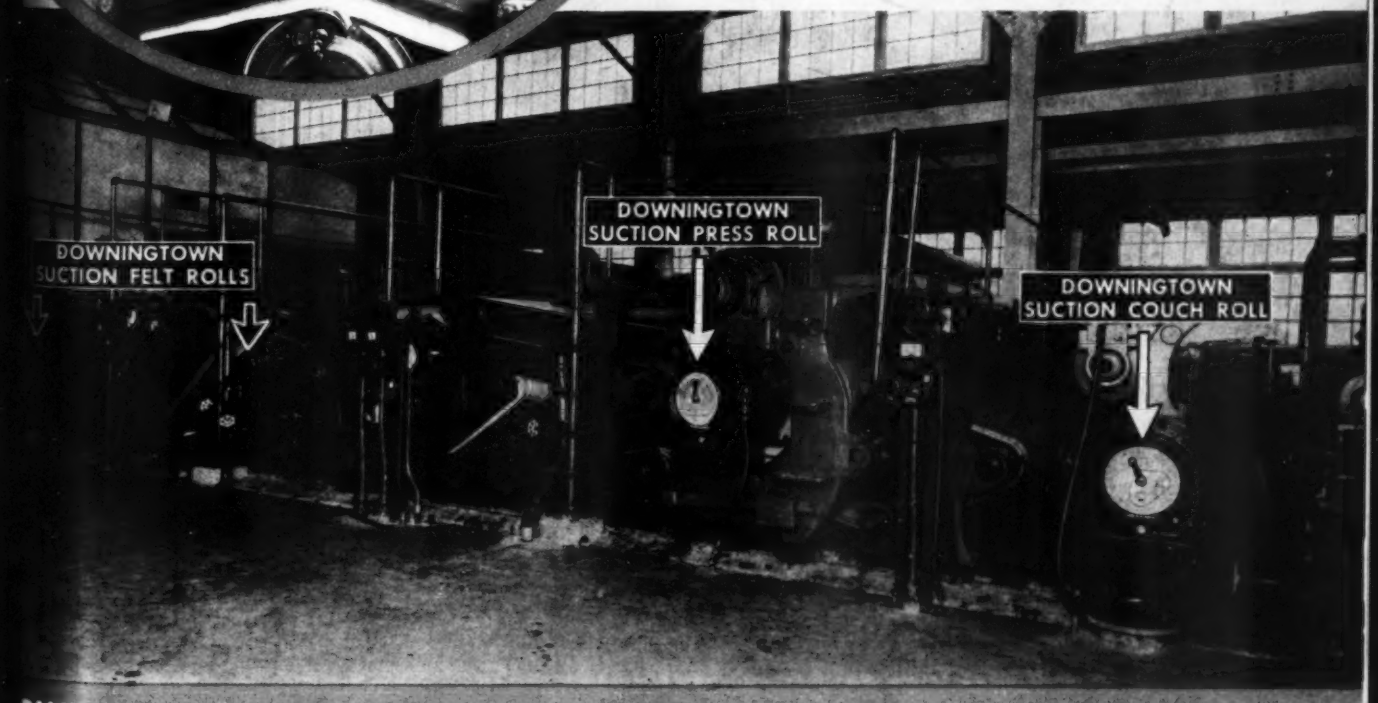


ACTION PHOTO

Continuous, Straight Line Cleaning and Conditioning with Suction Felt Roll

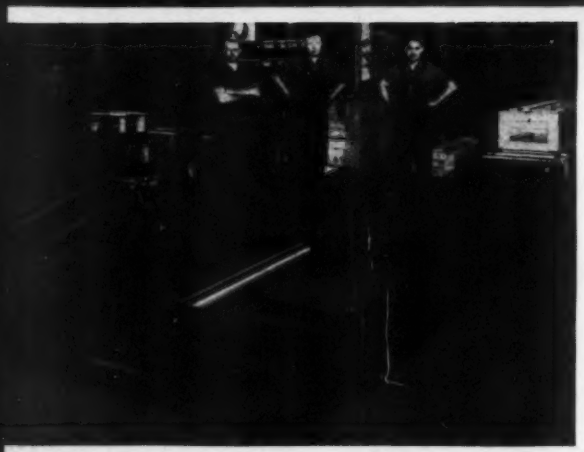
Difference in color of the felt, wrapped around the Downingtown Patented Suction Felt Roll in the unretouched photograph at the left, shows the cleaning and conditioning action straight across the felt. Continuous operation does not affect felt life, for there is no rubbing. Travel of the felt turns the roll, thus no power or drive is required. Easily installed over a week end.

Send for Bulletin 118.



OWNINGTOWN MANUFACTURING COMPANY, DOWNINGTOWN, PA.

ROCKWOOD
automatic belt tightening
MOTOR BASES



Acceptance of the Rockwood automatic belt tightening motor base in the paper industry is not confined to Westvaco engineers alone. Many other big mills are using them, as our advertisements in *The Paper Industry* will from time to time show. *If you have not yet investigated the use of Rockwood pivoted bases for YOUR motors it may well pay you to do so now.*

30,000 POUND MOTOR ON ROCKWOOD PIVOTED MOTOR BASE

(West Virginia Pulp & Paper Co.)

Pictures show a 300 h.p., variable speed G.E. Motor used as a "stand by" unit for paper machine. The Rockwood base alone weighs nearly 5,000 lbs.—laid out and engineered by Westvaco engineers, who have had many previous experiences with Rockwood belt tightening motor bases for different types of paper mill machinery.

Famous as is this great paper manufacturer with its 28 paper machines and 134 beaters, West Virginia *engineers* are equally famous as men who *know* paper making. They have proved to their complete satisfaction that the principle of automatic belt tightening is a decided improvement for belted electric motors—that they do increase belt life—increase drive efficiency—assure continuous non-breakdown performance and reduce drive maintenance to a minimum.

ROCKWOOD MANUFACTURING CO., INDIANAPOLIS, I

READY WITH PORTLAND, MR. MACKLEM!
Beloit's switchboard cables weave a daily pattern as complex as a foundry work schedule. But aside from the heavy traffic involved in Beloit's all-out war effort, these intertwined cables are symbolic of the close ties existing between Beloit and its customers. *Maintenance problems*—as vital today as ever—are the constant concern of Beloit executives and service engineers. When not in the field, Beloit representatives are in touch with customers by phone. And each conversation confirms the saying, "When you buy Beloit, you buy *more* than a machine!"
BELOIT IRON WORKS · PAPER MACHINERY · BELOIT, WIS. U.S.A.
SERVING UNCLE SAM · FOR THE DURATION · 1ST
WHEN YOU BUY BELOIT . . .
YOU BUY MORE THAN A MACHINE!
BELOIT
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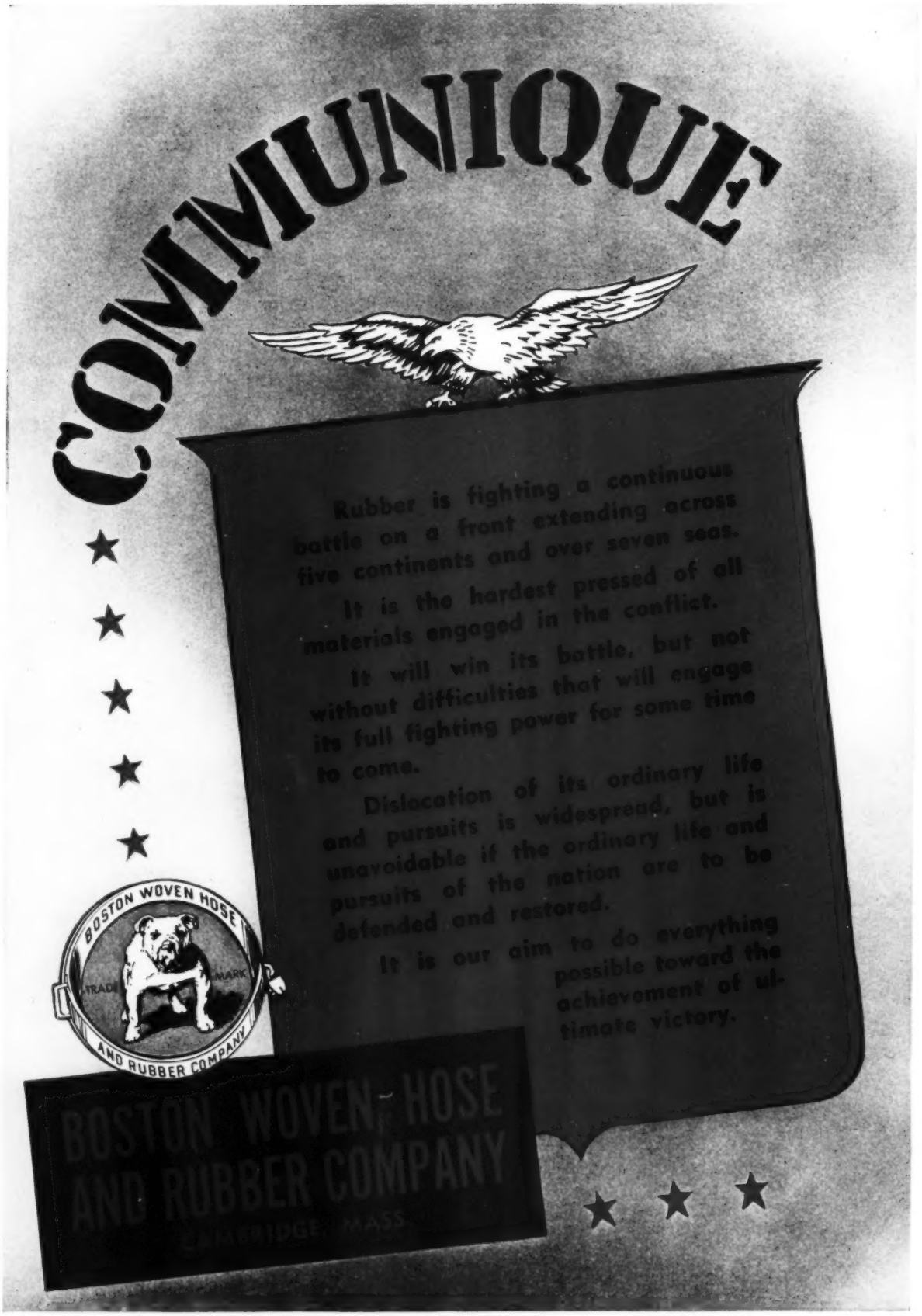
COMMUNIQUE
Rubber is fighting a continuous battle on a front extending across five continents and over seven seas.
It is the hardest pressed of all materials engaged in the conflict.
It will win its battle, but not without difficulties that will engage its full fighting power for some time to come.
Dislocation of its ordinary life and pursuits is widespread, but is unavoidable if the ordinary life and pursuits of the nation are to be defended and restored.
It is our aim to do everything possible toward the achievement of ultimate victory.
BOSTON WOVEN HOSE
TRADE MARK
AND RUBBER COMPANY
BOSTON WOVEN HOSE AND RUBBER COMPANY
CAMBRIDGE, MASS.

SUBDUES the noise
PROLONGS the life . . .

OF PAPER MILL GEARS

YOU can begin, immediately, to quiet your open gears and reduce their rate of wear, by lubricating them with *Texaco Crater.*

Texaco Crater spreads over the tooth surfaces and follows through from gear to gear. *Crater* clings to the teeth, despite peripheral speeds, high tooth pressures and temperatures. It will lubricate thoroughly and save you money.

The outstanding performance that has made Texaco preferred in the fields listed in the panel has made it preferred by prominent pulp and paper mills everywhere.

These Texaco users enjoy many benefits that can also be yours. A Texaco Lubrication Engineer will gladly cooperate in the selection of the most suitable lubricants for your equipment . . . just phone the nearest of more than 2300 Texaco distributing points in the 48 States, or write to:

The Texas Company, 135 East 42nd Street, New York, N. Y.

THEY PREFER TEXACO

★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

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40-page booklet for practical mill operators, treats of lubrication throughout pulp-and-paper-making process. Yours for the asking.

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FOR THE PAPER INDUSTRY

TUNE IN FRED ALLEN EVERY SUNDAY NIGHT—CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

THE CHEMICAL COMPOUND THAT OUTDID

Rip Van Winkle

• Commercially, *sodium chlorite* was asleep for 100 years. It was not until 1941 that it came into its own – when it was first produced in commercial quantities at Mathieson's new chlorite plant at Niagara Falls. Fourteen years of intensive research and practical experimentation by the Mathieson technical staff had preceded the actual construction and operation of the plant.

Long known to chemists by the formula $NaClO_2$, sodium chlorite has unusual oxidizing powers which make it an invaluable bleaching and processing agent. Today sodium chlorite is widely used in the paper and textile industries. It has successfully demonstrated its ability to bleach paper pulp and textiles to high whites without loss in tensile strength – a result that no other known processing agent has been able to achieve. Non-hygroscopic and readily soluble in water, sodium chlorite is highly stable both in solution and in solid form . . . can be heated to 150 degrees C. without decomposition.

Every day this exclusive Mathieson product is finding new applications in American industry – at a time when progress and production are as vital to victory as all-out offensives on the fighting fronts.

DO YOU KNOW THESE FOUR SODIUM CHLORITE PRODUCTS?

- *Textone* for textiles
- *C2* for paper pulp processing
- *Sodium Chlorite Technical* for general commercial oxidation and processing
- And, of course, the *pure analytical grade* used as a laboratory reagent

Mathieson CHEMICALS

THE MATHIESON ALKALI WORKS (INC.)
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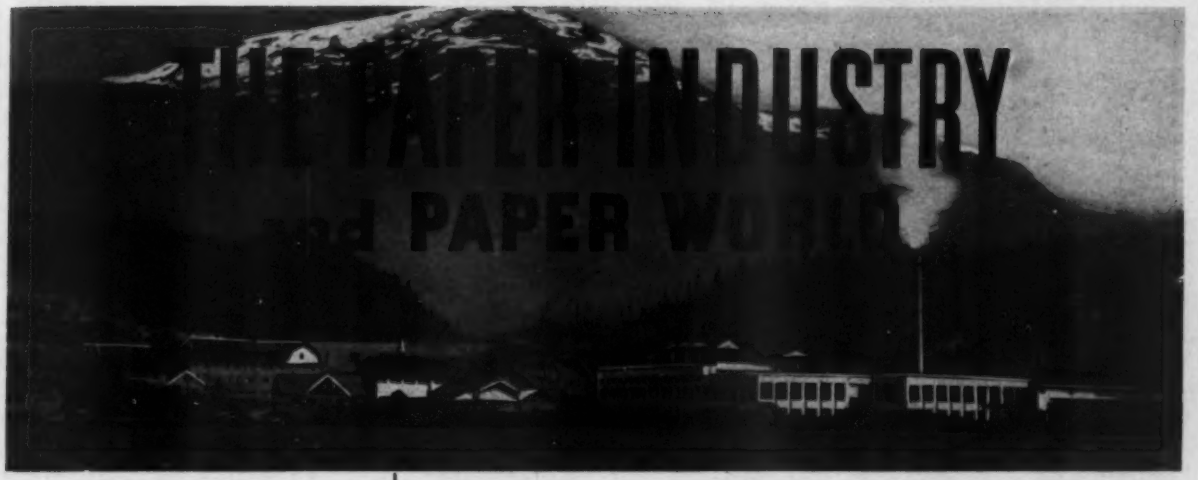

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standard method of removing

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***from* GASES**

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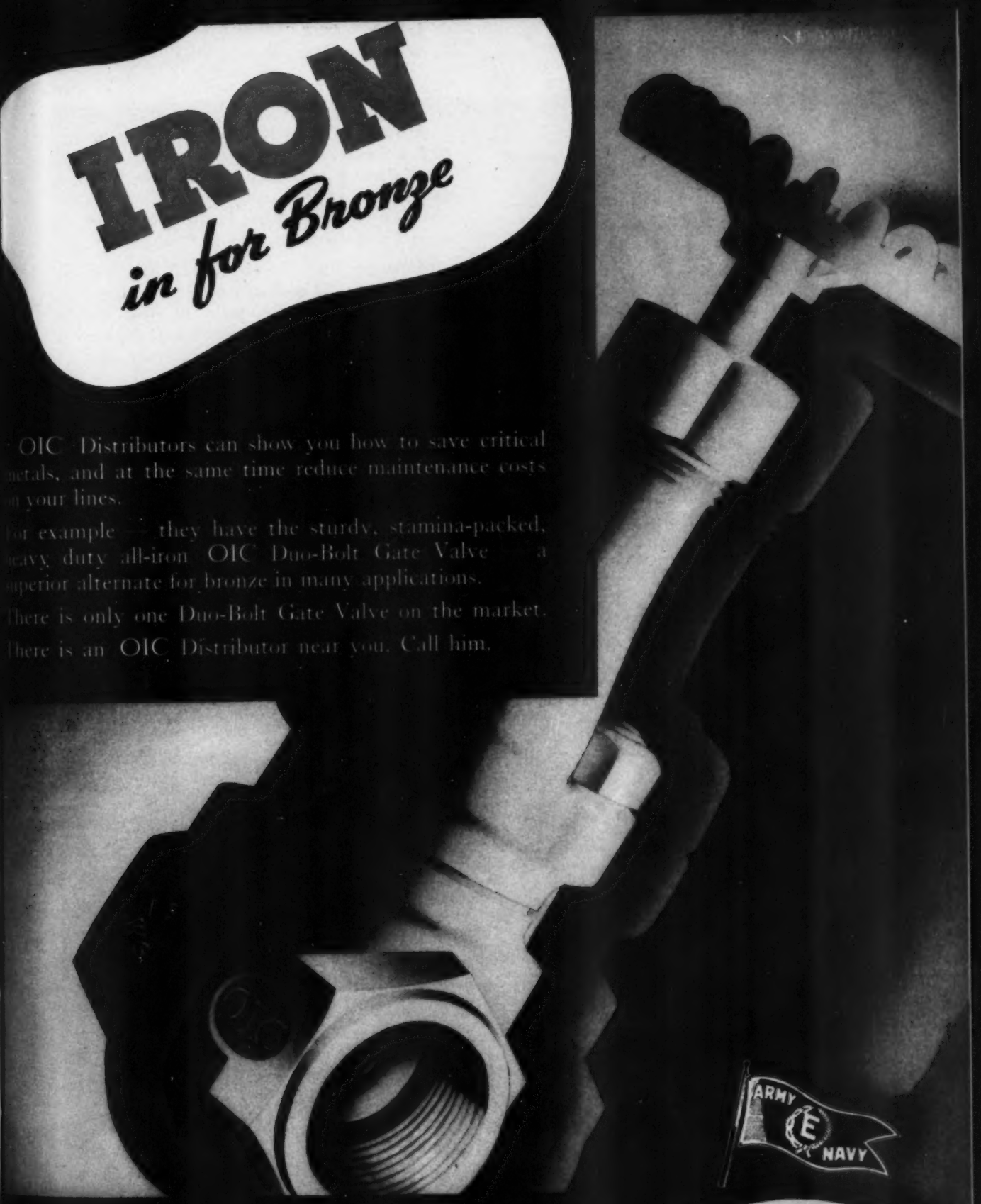
IRON *in for Bronze*

OIC Distributors can show you how to save critical metals, and at the same time reduce maintenance costs on your lines.

For example — they have the sturdy, stamina-packed, heavy duty all-iron OIC Duo-Bolt Gate Valve — a superior alternate for bronze in many applications.

There is only one Duo-Bolt Gate Valve on the market. There is an OIC Distributor near you. Call him.



THE OHIO INJECTOR COMPANY
WADSWORTH, OHIO
Valve Leaders in Valve Manufacture Since 1884

OIC

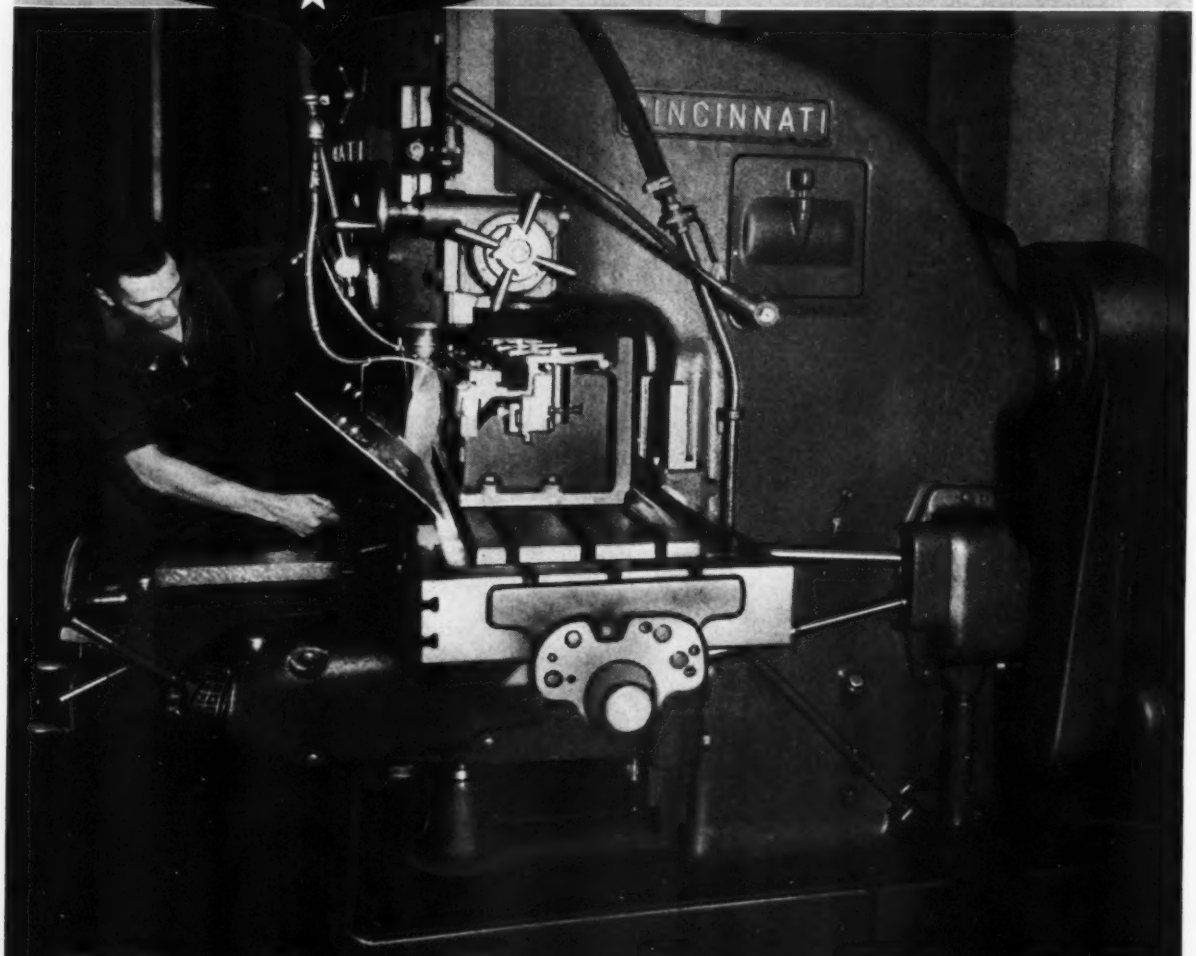
WHERE EVERY MINUTE COUNTS

★

American standards of production are a decisive factor in winning this war. Speed and accuracy are the by-words of today, and we at Valley are proud of our part in this greatest of all production drives.

Pictured here is our No. 5 Milling Machine — it can almost read blue-prints. And soon again it and its fellows will build the streamlined equipment we are readying for post-war papermaking.

VALLEY IRON WORKS CO.
APPLETON, WISCONSIN



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Slices and Head Boxes • Screw Presses • Micro-Mist Spray Dampeners • Laboratory Equipment
Pulp Washing Systems • High-Speed Beaters • Breaker Beaters • Vortex Beaters • Plug Valves
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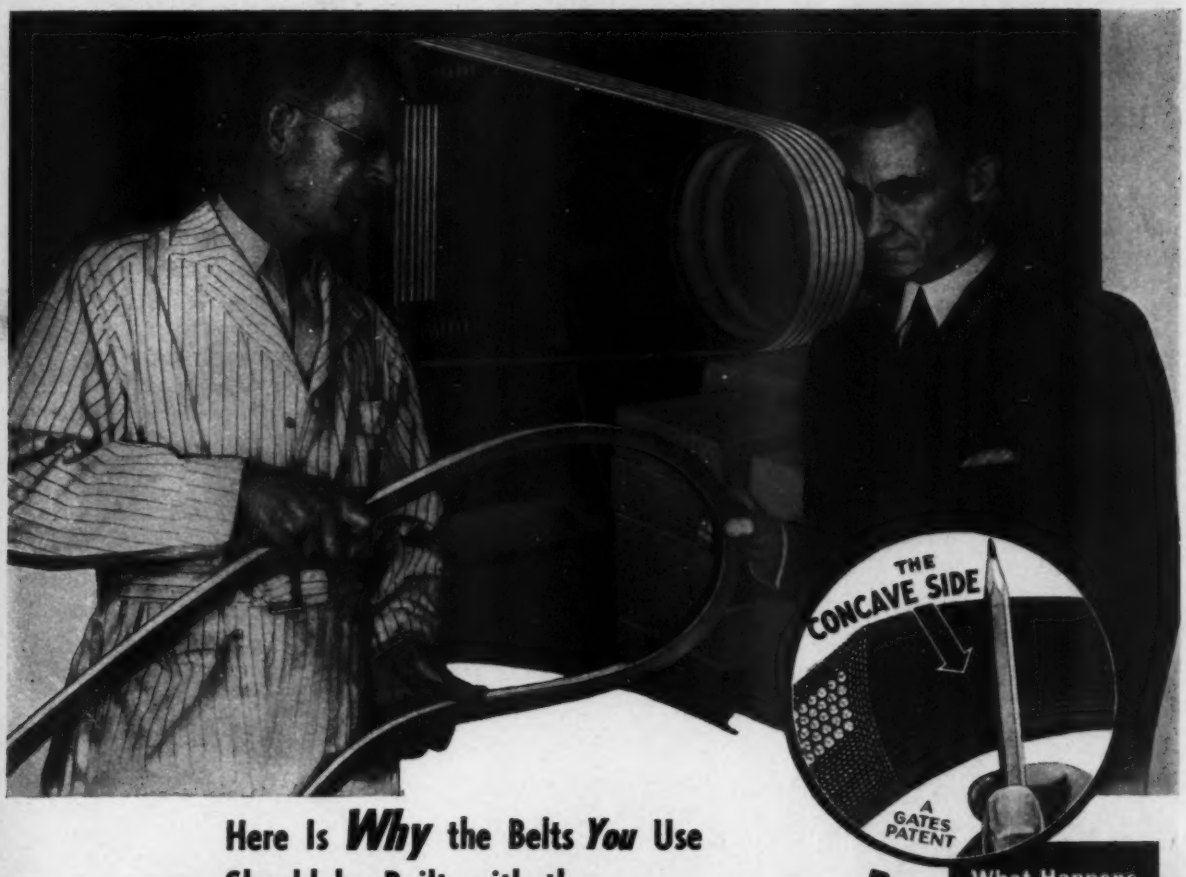


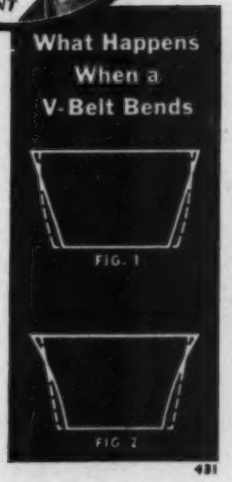
Here Is *Why* the Belts *You* Use Should be Built with the

CONCAVE SIDE!

A very simple test (pictured above) will show you the great importance of the Concave side. To make this test, take *any* V-Belt and bend it as it bends in going around its pulley. With your fingers, grip the sides of the bending belt. You will feel those sides *change shape*. Fig. 1, (on the right) shows what this shape-change does to a *straight-sided* V-Belt. Note the out-bulge of the sides.

Now look at Figure 2. There you see how *differently* the same shape-change affects a V-Belt built with the patented Concave side. The Concave side merely becomes straight—and this makes the bending belt exactly fit its sheave groove. There is no side-bulge. This means that wear is distributed *evenly* over the *whole side* of the belt—insuring longer life! Also, the whole side of the belt uniformly grips the sheave wall. This means heavier loads are carried without slippage—a real saving in belts—which conserves one of the nation's vital resources—rubber!

Only belts built by Gates are built with the Concave side, a Gates patent.



481

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

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Dallas, Tex. 2213 Griffin Street
Portland, Ore. 339 N. W. 5th Avenue
San Francisco, Cal. 1090 Bryant Street

NORTON ABRASIVES

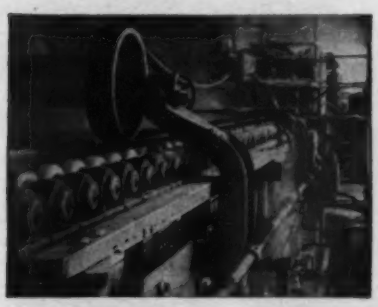
THE most important variable in the grinding of wood is the condition of the surface of the stone. Accordingly the grain, grade and structure of the Norton stone have been designed and arranged so as to be flexible and adapted to producing not only a wide range of pulps, but also capable of grinding the best grade of pulp from a wide variety of woods.

NORTON COMPANY

WORCESTER, MASS.

Calender Stack Bearings are subjected to high pressures and heat generated by friction. Because of this, heavy oils are generally used, although rolls are operated at fairly high speeds. Whether bearings are lubricated individually, as above, or by a circulating system, the oil used must have unusually high stability. Stanoil has operated over long periods without any sign of deposit formation in bearing wells.

In Jordan Bearings speeds and pressures are high and excessive temperatures frequently occur. The high grade Stearns-Stafford anti-friction bearings pictured above have been successfully lubricated for a number of years with high temperature Superla X Greases. Where these bearings are fitted for oil lubrication, Stanoil is recommend by this manufacturer.



Wet End Roll Bearings are particularly difficult to lubricate because they are subjected to a constant shower of water. The wide variation in types of bearings in use complicates the problem. The enclosed anti-friction bearings (above) require a high grade moisture-resistant grease such as Superla Greases, while a sleeve-type half-bearing requires a highly compounded water-resistant oil to prevent washing away.

Beat the Bearing Shortage This Way...

● Moisture, heat, shock loads and all the adverse conditions under which bearings in paper mill equipment must operate, make the job of lubrication one of the toughest in all industry. Add to this the difficulty in getting replacement bearings now, and you have several good reasons for making certain that you have the right lubricant, the right grade, and the best method of application on every bearing in your plant.

Day after day Standard Lubrication Engineers are working with mill men. Their experience with mill equipment, combined with their knowledge of lubricants and good lubricating practice, has aided many operators in solving particularly knotty bearing maintenance problems or in reducing lubricating cost-per-ton through a complete plant lubrication survey.

A little time spent with one of these Engineers may add a lot of time to the life of some hard-to-get bearings in your plant.

Write Standard Oil Company (Indiana), 910 South Michigan, Chicago, Ill., for the Engineer nearest you.

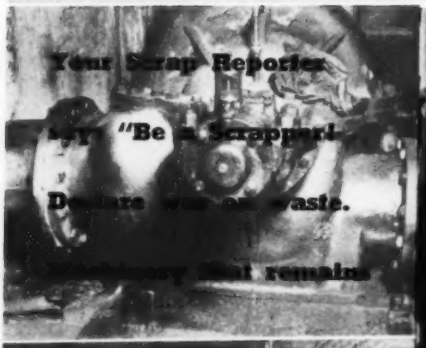
In Dryer Journals widely varying temperatures in bearings on the same machine present a problem, particularly in grease lubrication. In order to avoid using a number of grades of grease on one machine, Standard Lubrication Engineers analyze methods of application to help control the rate of feed, eliminate over-consumption and glazing. Stanolind Mill Grease reduced consumption 30% on the dryer journal above.

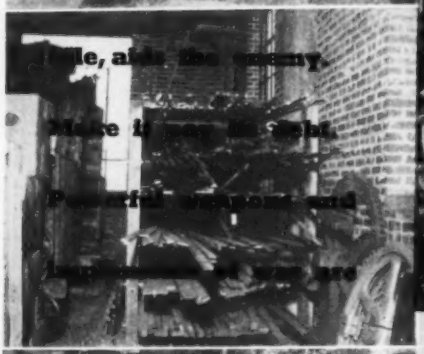
LUBRICATION ENGINEERING ★ STANDARD OIL COMPANY (INDIANA)

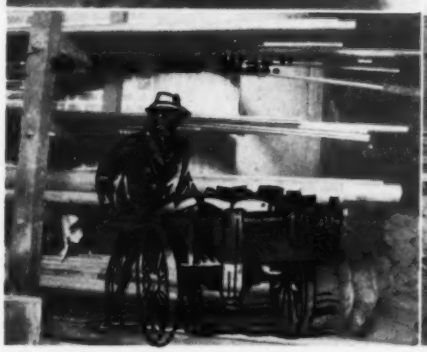
Oil is ammunition . . . use it wisely

If you can't use it . . .

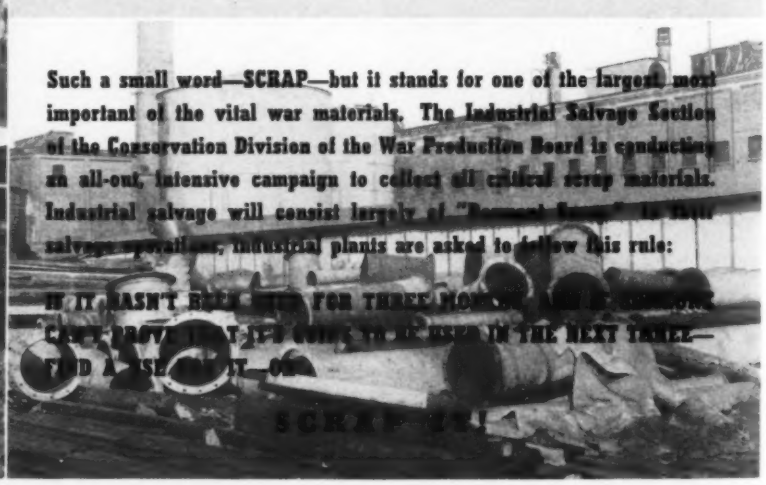
Scrap It!







A paper mill president takes part in the salvage campaign. Charles W. Smith (wearing sweater), president and general manager of the Central Paper Company, Muskegon, Michigan, discusses with one of his men the company's plans for collecting more scrap iron and steel for the war effort (See page 1008).



Such a small word—SCRAP—but it stands for one of the largest, most important of the vital war materials. The Industrial Salvage Section of the Conservation Division of the War Production Board is conducting an all-out, intensive campaign to collect all critical scrap materials. Industrial salvage will consist largely of "Prompt Scrap." In their salvage operations, industrial plants are asked to follow this rule:

IF IT HASN'T BEEN USED FOR THREE MONTHS, AND IF SOMEBODY CAN'T PROVE THAT IT'S GOING TO BE USED IN THE NEXT THREE—FIND A USE FOR IT—OR

SCRAP IT!

TRADE WINDS

NAM WAR CONGRESS *of American Industry*

[illegible] from all parts of the United States took time off from their wartime tasks to attend the 50th annual meeting of the National Association of Manufacturers. From the opening of the first session at the Waldorf-Astoria Hotel in New York City on Wednesday, December 3, through to the close on Friday, there was an almost continuous chain of important and dynamic speakers woven into a fabric of events, all of which accented the purpose of this gathering which had been called the *War Congress of American Industry*.

More than a national interest was drawn to this conclave, which included representatives of private enterprise, big names in most of the leading industries, and men high in governmental administration. President Roosevelt sent a message to the Association, and there were cablegrams from General Douglas MacArthur in Australia and Generalissimo Chiang Kai-shek. Chief of Staff of the U. S. Army, General George C. Marshall, also sent a message "From Our Fighting Men." Several of the addresses were broadcast by radio.

The theme which predominated all of the sessions was set by the Association's president, William P. Witherow (president of Blaw-Knox Company), in his keynote address, "Making America Strong."

Forty-four notable speakers, each a well-known authority, addressed the Congress on timely subjects. Highlighting the program were: A panel discussion on Wartime Labor Relations, a symposium on Industry's Plan for the Postwar Period, Civilian Industry Panel, Manpower and Selective Service Panel.

Throughout the addresses and discussions there was, of course, variance of opinion and viewpoint; however, running through everything was a serious undertone—a full acceptance of the vital part industry must perform in the war effort. But a bright and interesting picture of the Possibility of Postwar Prosperity was presented by Dr. Ralph Robey, associate editor of *Newsweek*. In his economic outline, Dr. Robey premised his study of the subject on four broad, economic ingredients that make for prosperity: (1) purchasing power in the hands of the public; (2) demand for goods; (3) productive capacity to turn out the goods; and (4) an adequate labor force to use the productive facilities.

One of the impressive events of the Congress was the "E" Award Luncheon, which was said to be the largest luncheon crowd in the history of the Congress. More than 2,000 persons were present in the grand ballroom when more than 800 men who have received the "E" Navy and Maritime Commission production awards were honored for their production records.

Within an hour after the Congress declared war following the attack on Pearl Harbor, the National Association of Manufacturers, on behalf of all its members, sent to President Roosevelt a pledge of allegiance and promise of [illegible] production. At the [illegible] one year after the war industry [illegible] this pledge and [illegible] announced by [illegible] ford, chairman of the [illegible] committee on [illegible] of the Timken [illegible] Cleveland, [illegible] Association's [illegible] Industry's Plan. [illegible] Crawford said "[illegible] funds for the [illegible] purposes. It will do [illegible] see that these [illegible] used when peace [illegible] oppose anybody who [illegible] them."

[illegible] resolutions dealing with [illegible] industry were passed by the Association's Resolutions Committee and adopted by the Congress. One of the resolutions—that dealing with [illegible] power—recommended the appointment of a single manpower administrator, was passed by the Congress scarcely more than 36 hours before an executive order of the President created such an office. A second resolution—that dealing with war production labor problems—was read to the Congress by Reuben B. Robertson, chairman of the Association's Committee on Industrial Relations.

Though faced with the stupendous responsibility of working out its industrial problems, management did not

[illegible]try's Pledge to Victory

● The [illegible] American Industry pledges all the skill and resourcefulness of industrial management to production for victory, to the end that no fighting man or civilian of the United Nations shall lose his life for lack of weapons or supplies.

● The Congress of American Industry further pledges that when, with God's help, the United Nations are victorious, industry will be ready to turn its skill and resourcefulness to the works of peace, to new wonders of production and plenty, which will provide employment for returning soldiers and sailors and all others, and enable the American people to resume their historic upward march, spiritually and materially, as free men.

lose sight of human relations and its part in the war. At the Thursday luncheon of the Congress, nine men and seven women—seven with loved ones with the armed forces and two who were blind—were honored. One of the most touching moments of this august assembly came with the introduction of one of the seven women honored. She was Mrs. Vera Staples Mueller, of Akron, Ohio, whose son was saved in the Solomon Islands by a life belt made at the plant where she is employed as an inspector.

The president-elect of the National Association of Manufacturers is Frederick Coolidge Crawford, president Thompson Products, Inc., Cleveland.

◆

SCRAPPY CAMPAIGN BUT WHAT A HAUL

One of the greatest nation-wide campaigns to speed the war effort has been the salvage of scrap metal. Though the Central Paper Company of Muskegon, Michigan already had scrapped 290,080 pounds of steel and iron during the first six months of 1942 and then dropped to 18,540 pounds in July and 44,650 pounds in August, when the urgent call was sent to industry last fall to scrap obsolete and unessential machinery, workers as well as officials of the company combed the plant and its properties on Muskegon Lake, and the result was an outstanding record among the city's industries. Poundage rose to 295,000 pounds in September and 131,658 in October. To this was added another 60,260 pounds in November, for a year's record of 840,608 pounds, or 420 tons of metal. This represented more than 10 per cent of Muskegon County's quota for the United Scrap Metal Drive in which a record of 159 pounds per capita was registered. In addition, Central Paper had scrapped 23,796 pounds of brass and 5,270 pounds of copper during the first half of the year.

Mosinee Paper Mills Company, Mosinee, Wisconsin, salvaged about 275 tons of vital metals from idle machinery in its power plant alone. The company previously had shipped out 420,075 pounds of assorted metals, 4,805 pounds of rubber, and 1,845 pounds of rags.

In the monthly publication of the Hammermill Paper Commpany, Erie, Pennsylvania, *The Hammermill Bond* the company's scrap drive was headlined. In its campaign, collections amounted to 40,000 pounds of scrap steel, 12,600 pounds of lead, 9,950 of red brass, and between 10,000 and 20,000 pounds of yellow brass.

KVP BUYS ABITIBI ESPANOLA PLANT

The properties of the Abitibi Power & Paper Company, Ltd., general headquarters Toronto, Ontario, have been in receivership for approximately the past ten years, during which time a long chain of litigation and proceedings has been woven into the records.

The first real development in the affairs of this company since the receivership was established was the announcement on January 7 by Ralph A. Hayward, president of the Kalamazoo Vegetable Parchment Company, Parchment, Michigan, that the KVP Company had purchased the Abitibi mill at Espanola, Ontario. The announcement stated that the purchase involved the groundwood mill, paper mill, hydroelectric plant, and the complete townsite, plus arrangements with the Canadian Government for time concessions constituting cutting rights on about 4,000 square miles of land.

The Espanola mill has been idle since 1938. It formerly produced groundwood pulp and newsprint. The equipment of the plant is listed as follows:

Groundwood Mill
38 Grinders
10 Wet Machines
Paper Mill
10 Beaters
3 Jordans
1 Appleton Jordan
Fourdrinier Machines
2—118 in.
2—162 in.
2—164 in.

The announcement from KVP stated that the property would be converted to produce chemical pulp for use at the company's Parchment plant as soon as construction permits and other permits and authorizations can be obtained from Canada. This would probably come after the War.

It is understood that the deal just consummated has been under consideration for the past nine months.

◆

PAIRPOINT CORP. SELLS CONE AND TUBE DEPT.

Stockholders and voting trustees of the Pairpoint Corporation, New Bedford, Massachusetts, recently voted to sell the cone and tube department, with all apparatus and equipment, together with a portion of the machine shop equipment. The directors recommended that the bid of $110,000 received for all machinery and equipment of the department from the Sonoco Products Company of Hartsville, South Carolina, be accepted. This company has offered to buy as much of the inventory and stock on hand as possible, at a price to be agreed upon with the Pairpoint directors after an inventory is taken. Seabury Stanton, president of Pairpoint, estimated inventory value roughly as $40,000 to $50,000.

The directors advised complete liquidation of the company as soon as possible, but have no present bid for the paper mill and real estate. Therefore, operation of the paper mill and power plant will be continued in the hope that it can be sold as a going concern.

◆

FINANCIAL

▶▶▶ THE PAPER INDUSTRY securities experienced the usual end-of-the-year realizing sales, but the tone of stocks and bonds prices remained generally satisfactory during December.

Albemarle Paper Manufacturing Company—In the six months ending September 30, the company experienced a loss of $11,246 as compared with a net income in the same six months of 1941 of $232,304.

A.P.W. Paper Company—Net profit for the period from July 1, 1942, to October 24, 1942, was $2,188 as against a profit of $27,298 for the comparable period in 1941.

Champion Paper & Fibre Company—Net earnings for the second quarter of the fiscal year ending November 8 were $936,921 as against $672,763 for the first quarter.

Crown Zellerbach Corporation—Net profit for six months ending October 31 was $3,594,048 as against $4,611,770 for the comparable period in 1941.

Eastern Corporation—Net income for the nine months ending September 30 was $328,461 as against $548,307 for the same period in 1941.

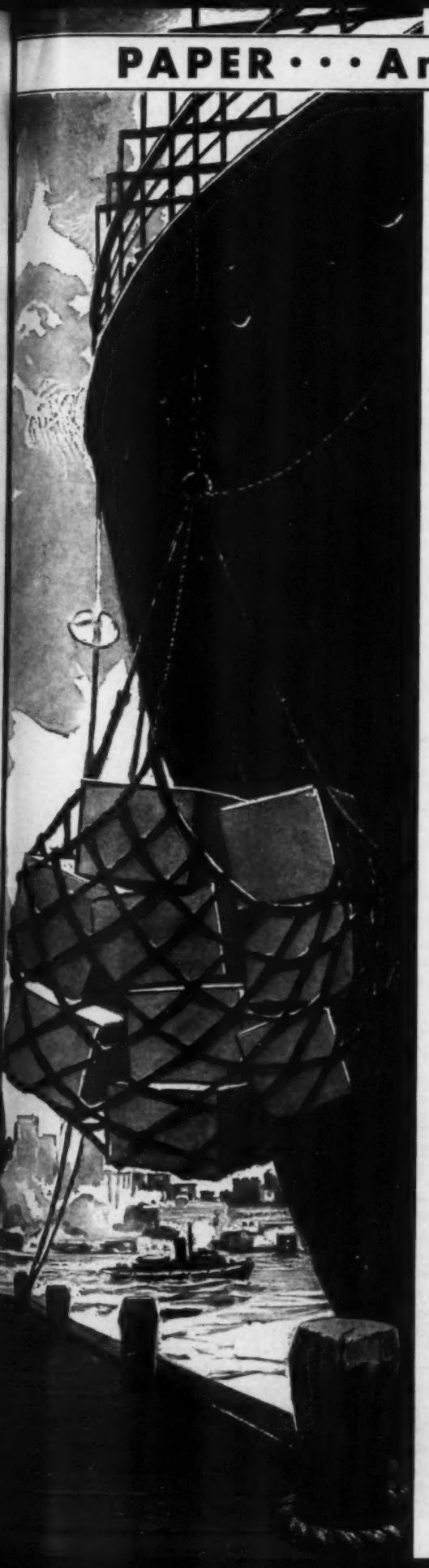
Gaylord Container Corporation—Net profit for the quarter ending September 3, 1942, was $300,476 as compared with $453,828 for the comparable quarter of 1941.

Great Northern Paper Company—Net profit for six months ending September 30 was $904,153 as compared with $1,878,136 for the same period in 1941.

National Container Corporation—Net profit for the nine months ending September 30 was $583,357 as against $822,035 for the same period in 1941.

Puget Sound Pulp & Timber Company—Regular quarterly dividend of 30 cents a share on the preferred stock

PAPER · · · America's 6th Industry



TEN TOUGH PROBLEMS

(NEWS ITEM: *The Army Quartermaster Corps has asked the assistance of the Pulp and Paper Industry in the solution of ten military ration container problems.*)

Packaging for the Army's food must withstand temperatures from 20 degrees below zero to 130 degrees above zero. Shipping cases must be unloaded into surf and subjected to tropical rains. Subsistence stores are subject to frequent transfer and the handling is usually rough.

Among the military ration container problems now under study in the Pulp and Paper Industry are the following: a water-tight package; a moisture-vapor-resistant package; high degree of protection against insects; better packaging for dried fruits; a climate-proof wax paper; a water-resistant sheet; a grease-proof packaging for shortening; determination of rate of oxygen transfer through paper; better fibre-bodied cans; shipping cases proof against rats.

In meeting the demands of the war effort, the Paper Industry is assured of the whole-hearted cooperation of Puseyjones.

The "Rapidrape" method for installing Fourdrinier Wires has resulted in faster, safer wire changing. Production formerly lost through long shut-downs is reduced to a minimum.

This exclusive Puseyjones development removes the danger of deflection stresses and distortion. The Fourdrinier part remains in perfect alignment at all times.

Puseyjones men and production facilities are on war work. In the meantime, we are doing our best to supply replacement parts to keep present equipment operating efficiently.

All orders subject to priority conditions of War Production Board.

THE PUSEY AND JONES CORPORATION

Established 1848. Builders of Paper-Making Machinery

Wilmington, Delaware, U.S.A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

has been declared, payable January 1, 1943, to stockholders of record December 16, 1942.

Rayonier, Inc.—Net profit for the six months ending October 31 totaled $1,078,298 as compared with $935,760 for the single quarter ending October 31, 1941.

Southern Advance Bag & Paper Company—Net income for ten months ending October 31 was $566,971 as against $519,235 for the same period in 1941.

St. Regis Paper Company—A dividend of $1.75 a share on the preferred stock, payable on account of accumulations January 2 to stockholders of record December 10, has been declared.

New York Stock Exchange—Stocks

	Closing Prices Jan. 1, 1942	Dec. 31, 1942	Nov. 25, 1942
A. P. W. Paper Co.	1⅜	1⅜	*1⅜–1⅞
Celotex	7¼	8⅜	7¼
Same Preferred	66	75½	69
Certain-teed	2¼	2¾	3
Same Preferred	28	31½	30
Champion P. & F. Co.	17	17¾	*18⅜–18⅝
Same Preferred	99¾	100	99¾
Container Corp.	12½	16¼	15⅛
Cont. Diamond	8	6¾	6⅞
Crown Zellerbach	10¾	11⅛	11
Same Preferred	80	*81–84	80
Dixie Vortex	8¾	9¾	*8¾–9⅛
Same "A"	34	39	36
Robert Gair	2	1⅜	1¾
Same Preferred	10¾	9	8⅞
Gaylord Container	10¼	9¼	9¾
Same Preferred	50½	*51–54	*48–54
International Paper	14	8⅛	8⅛
Same Preferred	58	45⅜	44½
Kimberly Clark	28	*25–26	*26–26½
MacAndrews & Forbes	21	20	28½
Masonite	27	33¾	28½
Mead Corp.	6½	6	5¾
Same Preferred	79	*66–69	*66–69
Paraffine Cos.	25	36⅝	31¾
Same Preferred	97	*94–100	*98¼–100
Rayonier	9½	12	16
Same Preferred	25	26½	26
Scott Paper	32	38	37⅞
Same 4½% Pfd.	114	113½–114	*114½–115
Same 4% Pfd.	109	*106–110	*111–114
Sutherland Paper	19	26⅛	*23¾–24¾
Union Bag & Paper	8¾	7⅞	7⅞
U. S. Gypsum	45½	61	57
Same Preferred	175	*173–174½	*173–175

New York Stock Exchange—Bonds

Abitibi 5%	45	50	49¾
Celotex 4½%	91	99	.....
Certain-teed 5½%	84¼	93	92¼
Champion P. & F. Co. 4¾%	102	104	.....
Inter. Paper 5%	105	102¾	103
Same 6%	105	105½	104⅞

New York Curb Exchange—Stocks

Am. Boxboard	4	4⅜	4
Great Northern	29	25¾	.....
Hummel-Ross	4	3¼	3¼
St. Regis	2	1½	1½
Taggart	3¼	3¾	2⅞
United Wall Paper	1⅛	1⅜	1⅜

*Closing Bid and Asked Prices

NEW 3-YR. PLAN AT THE N. Y. STATE COLL. OF FORESTRY

According to a new plan establishing a three-term year at the New York State College of Forestry at Syracuse University, Syracuse, New York, students will be admitted on the following registration dates: January 19-20, classes beginning January 21 and May 31—June 1, classes beginning June 2.

Dean Samuel N. Spring also announced that superior students who have finished satisfactorily three years or three and a half years in high school with the necessary requirements for regular or proposed special courses will be eligible for enrollment in January and in June. Due to the war emergency, the program is being rearranged so as to deal with those subjects that will be most helpful in pre-induction or pre-industrial training, and students who are unable to complete a full-study program may return and complete their college courses after the war.

◆

PAPER CONTAINERS TO REPLACE TIN

McKesson and Robbins, Inc., has adopted a newly developed compressed paper container for packaging tooth powder, aspirin, and cold tablets, as a result of a WPB order forbidding the use of tin plate for packaging drug products. McKesson and Robbins formerly used approximately 1,357,000 pounds of metal annually. The new containers are made of several layers of paper laminated by a special process involving both pressure and heat. Savings in shipping weight and space have been effected through use of the new containers.

◆

STREAM POLLUTION STUDY ORGANIZED AT KALAMAZOO

A new two-county committee to study ways and means of eliminating pollution of the Kalamazoo River within Kalamazoo and Allegan counties (Michigan) has been organized. This committee will follow the work begun two years ago by a group set up by the Michigan Stream Control Commission. This group has nearly completed its study and survey of the river pollution problems, and the new general committee will be given access to the technical committee's report. Also, the State Stream Control Commission offered the services of its technical staff to the Kalamazoo Valley committee.

Edwin C. Rutz, Bryant Paper Company and former Kalamazoo city manager, is chairman of the new committee; Harry Bradford, Rex Paper Company and head of the original committee, is vice chairman. Other paper men serving on the new panel include L. W. Sutherland, Kalamazoo city commissioner and chairman of the board of directors of the Sutherland Paper Company; F. C. Fischer, Allied Paper Mills; and James Wise, Kalamazoo Paper Company.

◆

PAPER MILL NAVY

Many paper mills have plant police, but there is only one with a full-fledged naval unit—equipped with boats, guns, and all the trappings necessary for submarine fighting.

When the Nazi under-sea craft started operating on this side of the Atlantic early in 1942, they almost literally sank ships in the backyard of Bowater's Newfoundland Pulp & Paper Mills, Ltd. at Corner Brook, Newfoundland. Officials of the paper mill took immediate action. H. M. S. Lewin, who served in the British Navy in the World War, holds the rank of Lieut.-Commander in the R. C. N. V. R. An appeal was made to the Royal Navy and the Canadian Navy to permit the formation of a volunteer naval unit at Corner Brook.

It is now permissible to report that both the Canadians and the British encouraged the operations at once. Equipment was furnished for the small boats obtained locally, and the boats were operated in conjunction with regular units of the high seas patrol.

The principal Senior Officer of the Paper Mill Navy is Lieut.-Commander H. M. S. Lewin, R. C. N. V. R. Under Mr. Lewin are Lieutenant F. P. Silver, mill manager, and Lieutenants L. Lang and L. L. Reid, senior superintendents at the paper mill.

Regular naval ratings were supplied by the Royal Canadian Navy to man the patrol craft. The Canadians also sent Lieut. A. I. MacKay, veteran corvette officer, to Corner Brook to assist in equipping the ships and shore installations, and also to train the Paper Mill Navy in modern sea-war technique.

The Paper Mill Navy is now an organic part of the Royal Canadian Navy and it operates with it on a 24-hour basis. In addition to the officers, recruited from the paper mill management, crews are made up from local men either volunteer or full-pay status.

Some day the saga of the sea-going papermakers will be told. Until that time all that can be said is that the

Foreign Enemy Attacks—

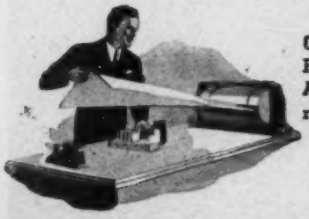
Paper mills, like nearly every American industry, wage a continuous battle against mold and decay. In paper making processes, large amounts of water are used—water that carries fungi, algae and slime-forming bacteria. Wood pulp in storage is also vulnerable to stain and decay. These enemies are a threat to both quality and quantity of finished materials.

To help win this fight for better products, manufacturers call upon Dowicide industrial germicides and fungicides.

Small quantities of one or more of the 17 Dowicide products are used in various processing operations to inhibit the growth of fungi and bacteria. They are helping to make better paper, leather, paint, lumber, and many other materials.

THE DOW CHEMICAL COMPANY, MIDLAND, MICHIGAN

New York • St. Louis • Chicago • Houston • San Francisco • Los Angeles • Seattle



OTHER PROTECTIVE SERVICES PROVIDED BY DOWICIDE: Preservation of lap and pulp stock—Dowicide F or G; longer felt life—Dowicide G; preservation of mold resistant paper products—Dowicide A, B and G; prevention of decay and termite attack—Dowicide G; for reducing maintenance costs—Dowicide 7, preserves structural timbers. Write for full details.

DOWICIDE

GERMICIDES AND FUNGICIDES

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND VICTORY

mill men of Corner Brook are in the Navy now, and because of this the life-lines to the plant are being kept open.

◆

NEW DESIGN OF PAPER CONTAINER

A new design of liquid-tight and sift-tight container is covered by the patent application of Julius A. Zinn, Jr., former dairy operator on the Pacific Coast and now of 360 N. Michigan Ave., Chicago. The container, which may be either of single or double wall construction, is of the nesting type. It has a pressure, heat-sealed, top closure, and a gable top of a cushion design to permit expansion of contents. Several methods of inserting a pour opening are possible. All types of opening, once opened, can be reclosed to prevent contamination of contents.

Outstanding features in the design of the container blank are as follows: All four corners of the container are tight; the bottom is flat; the seam effects a tamper-proof closure. The wicking between the bellows folds at the top to insure tightness and to permit the use of a single fold over flap.

The printing of the blanks, as well as the die cutting and scoring, can be done on any standard equipment for the purpose; and the fabrication, automatically at a speed of not less than 60 a minute, on a machine now on the market with only minor revisions to it. In fabricating, the blank is fed automatically into the machine, the glue being applied automatically to one side of the blank and the blank then wrapped around a mandrel. The seaming of the container is effected while the mandrel rotates in a forward position, closing the bottom folds and applying pressure thereto.

No coating is needed if the container is to be used for dry products, such as powders and the like. For liquids, a coating is necessary. The particular coating selected must not affect the product packed in the container especially if the product is for human consumption. Whatever coating is used, it is only for liquid proofing, oil proofing or grease proofing of the board.

The container can be made at the present time in sizes from very small up to a two quart and/or a 5 lb. capacity. By using an inner wall of board, it is possible to produce a container, even in the smallest size, with a .020 in. outer wall and a .020 in. inner wall.

The nesting feature of the design enables the packer to receive the containers ready to be filled, and, in many cases, adapted to the filling equipment in use by him.

The manufacture of the container is controlled by the licensing and royalty system.

◆

REPORTING OF STATISTICAL DATA

Under date of December 18, E. W. Kiefer, chairman of the Statistical and Cost Engineering Committee of the American Paper and Pulp Association, sent the following appeal to all paper and pulp manufacturers:

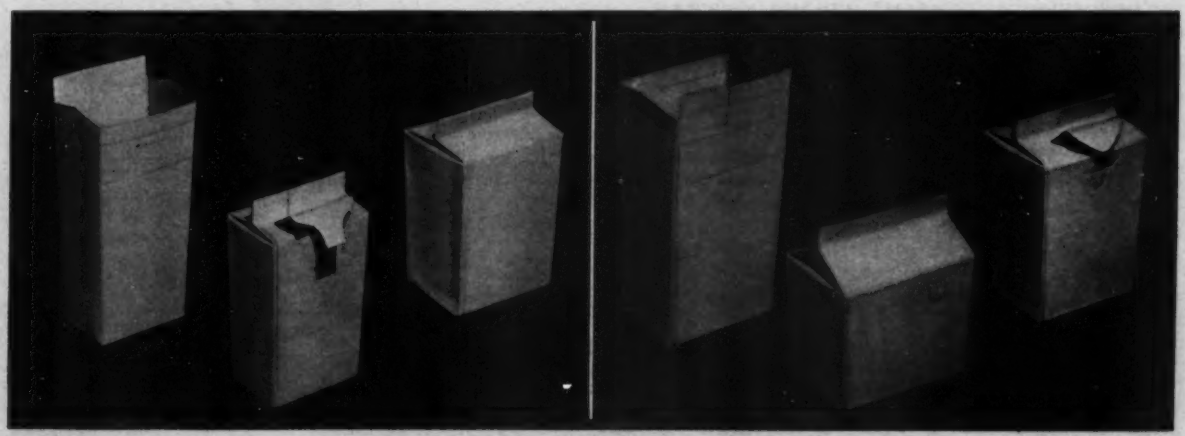
During the past year the Statistical and Cost Engineering Committee of the American Paper and Pulp Association has given careful consideration to the situation that has arisen as a result of the heavy demands for statistical information put upon the paper and pulp industry by various governmental agencies. The burden imposed by these extraordinary statistical requirements has been aggravated by personnel difficulties.

In an effort to reduce the volume of clerical work required in meeting government and association requirements there has been some tendency on the part of the industry to reduce and in some instances discontinue the reporting of statistical information to the Association.

The Committee in an effort to keep the labor involved in submitting reports to the Association at a minimum has gone on record against the undertaking of new statistical activities by the Association for the duration and has also urged the staff of the American Paper and Pulp Association to make every effort to correlate its reporting forms where possible with those used in reporting similar information to governmental agencies. It is believed that these two measures will do much to relieve the burden involved.

The Committee believes that the statistical data distributed by the American Paper and Pulp Association and its Divisional Associations are not only of great value to management but, in addition, form the broad foundation on which a great part of association activities are necessarily based. The committee wishes also to point out that statistical information furnished by paper and pulp mills to governmental agencies while undoubtedly of value to these agencies is not of value to management as summaries of the information furnished are generally not available to the industry.

In consequence, speaking for the Committee, I wish to urge every company currently reporting statistical information to the American Paper and Pulp Association and to its Divisional Associations to continue to do so, thus continuing the unbroken sequence of statistical series that have been maintained for many years.



Zinn's new design of paper container (Patent applied for).

CONTINUOUS-TOOTH
HERRINGBONE
GEAR AND PINION

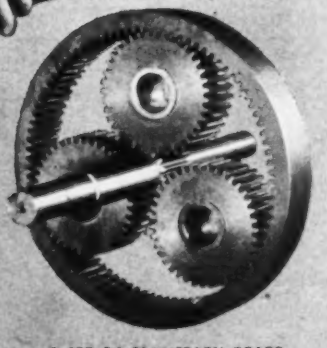
"General GEAR"
IS A FIGHTER TOO...

★ He's the guy that makes the Jeeps Jump... He's also the BIG-WORKS in the tank, battleship or airplane... in fact he's the BIG-WORKS in any Power-saving or Power-driving Machinery. HE'S GOTTA BE GOOD. Our organization of many years of Gear Making Experience is going to keep him fighting and to help keep all of us on top.

D.O.James

D. O. JAMES MANUFACTURING CO. 1140 WEST ROOSEVELT ST., CHICAGO, ILLINOIS

SET OF WORM GEARS



A SET OF PLANETARY GEARS

MAKERS OF EVERY TYPE OF GEAR AND GEAR REDUCER

Washington News

PAPER USE CUT FOR NEWSPAPERS, BOOKS AND MAGAZINES

▶▶▶ ORDERS CURTAILING the use of paper by newspapers and magazines were issued December 31, 1942, and on January 8, 1943, a similar order was put into effect on books.

Order L-240 Newspapers—The tonnage of print paper a newspaper publisher may use in 1943 will be 100 per cent of the amount used by him to produce his net paid circulation in 1941, plus a three per cent spoilage allowance. The issuance of this order closely follows recommendations made by the Newspaper Industry Advisory Committee at a meeting with WPB officials in Washington on December 10, 1942.

The Printing and Publishing Division of WPB estimates that the order will effect a reduction of approximately 10 per cent in the current consumption of print paper, but stressed the fact that this was an over-all estimate for the industry and by no means meant that each publisher would be cut 10 per cent. Under the order, some publishers will be cut more and some less, depending upon how they use their allotment of print paper, a matter entirely up to them. The majority of weeklies and small town dailies will not be affected by this order.

Order L-244 Magazines—This order provides that no magazine publisher shall use or cause to be used for his account print paper for the printing of his magazine during any calendar quarter in excess of 22½ per cent of the amount of such paper used by him or for his account during the year 1942.

Provision is made, however, that a publisher may, in any calendar quarter use up to 15 per cent more than his quarterly quota, the excess to be deducted from the quota of the succeeding calendar quarter. It is further provided that a publisher may in any calendar quarter, use additional print paper equivalent to the less-than quota usage of any preceding calendar quarter.

The provisions of the order were recommended to WPB by the Magazine Industry Advisory Committee. It is expected the industry generally will be able to meet the curtailment without any appreciable effect on the appearance and content of its magazines.

L-245 Books—This order, issued by the WPB on January 8, limits the amount of print paper book publishers may use during 1943 to 90 per cent of the tonnage of paper used by each publisher during 1942. Restrictions also are put into effect on paper for reprinting. Publishers who wish to reprint books are required to reduce by 10 per cent the weight of paper used in each copy of the book as last printed prior to January 8. Two exceptions to this last provision are: (1) exemption of books the last printing of which occurred before the date of the order, when such books were printed on paper of equal or lighter base weight; and (2) also exempted are books, the paper for which was ordered prior to date of the order and is scheduled for delivery to, or for the account of, the publisher within 45 days after January 8. These exceptions, however, do not exempt the publisher from the over-all 90 per cent limitation on the use of paper.

The main reason for the curtailment of paper consumption is that the estimated pulpwood supply available for consumption during 1943 will be approximately 20 million cords for all North America, including Canada, compared with a current consumption rate of 25 million cords a year. Shortage of manpower in the woods is the primary reason for the estimated decline in pulpwood supply.

The orders provide for consideration of individual appeals in cases of undue hardships.

An exemption to these orders excludes any publisher who shall use, on and after January 1, 1943, 25 tons or less of print paper in any calendar quarter.

It should be noted that the Base Period used in L-240 and L-244 differs. The base period for Order L-240, Newspapers, is the year 1941; that for L-244, Magazines, is 1942.

WPB ORDERS ROLL TISSUE CRUSHED

WPB has issued an order that all toilet tissue manufactured on or after December 5, 1942, must be shipped in collapsed form and also wound as tightly as possible. Last spring, the Scott Paper Company, Chester, Pennsylvania, recognized transportation as a vital problem and voluntarily increased the minimum carload weight of its products from 24,000 pounds to 30,000 pounds, and in addition reduced roll diameters by tighter winding of the paper. Subsequently, in conjunction with the U. S. Army, the company's research engineers developed machinery, the first of its kind to crush completely the roll toilet tissue that was to be shipped for use by our Armed Forces, and the resultant substantial saving in transportation space led to the recent order.

▶▶▶ LABOR HAS BEEN GIVEN recognition by the Pulp and Paper Branch of the War Production Board. Matthew J. Burns, president of the International Union of Papermakers, went to the War Production Board's labor staff in April, 1941, but has now been made a special assistant to Arthur G. Wakeman, chief of the Pulp and Paper Branch of the Board.

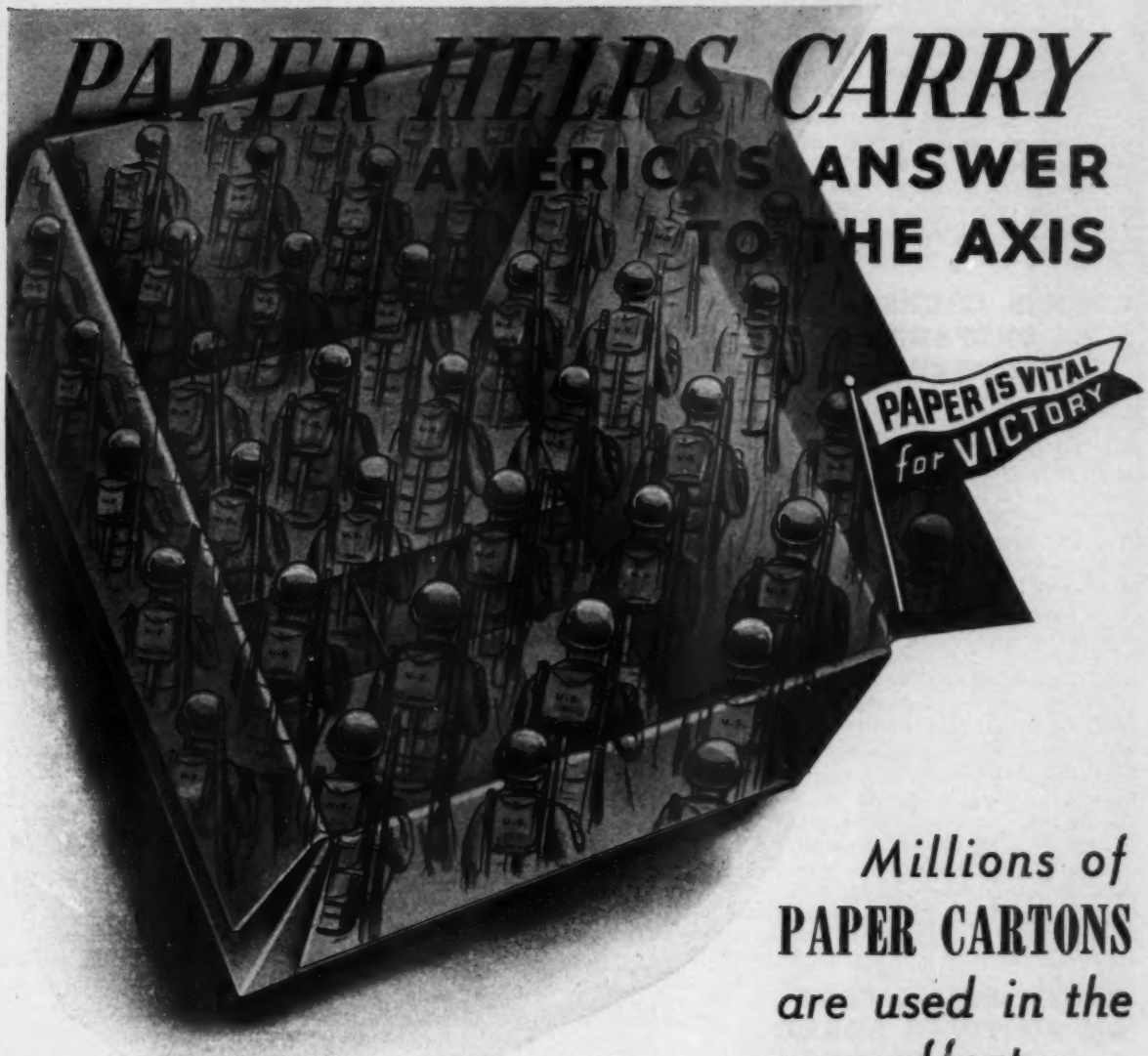
▶▶▶ THE BUREAU OF FOREIGN AND DOMESTIC COMMERCE has again formed industrial units, under an Industrial Economy Division, and W. LeRoy Neubrecht has been made head of the Pulp and Paper Unit. These sections existed until the beginning of the war, were then discontinued, and now are being reorganized on a somewhat different basis than under the old system.

▶▶▶ A FURTHER REDUCTION of the amount of chlorine available for pulp and paper manufacture is contemplated, and several recent advisory committee meetings have been held to consider the problem of how to fairly allocate the available chlorine under a new limitation order.

▶▶▶ LEON HENDERSON has not only resigned as head of the Office of Price Administration, but also as director of the Office of Civilian Supply. In this capacity he had much to do with determining the need for paper for civilian uses, while as head of OPA he fixed the ceilings on paper pulp and paper products.

▶▶▶ AN INCREASE in the ceiling price for newsprint seems assured. A proposed increase some months ago from the present $50 base to $53 was

PAPER HELPS CARRY AMERICA'S ANSWER TO THE AXIS



Millions of
PAPER CARTONS
are used in the war effort . . .

Paper cartons have become a vital part in the war effort. Serving in many cases as a substitute for critical metals, millions of paper containers are used to carry rations, dehydrated food, hand grenades, mine fuses, cartridges, shells, medicinal products and innumerable other essentials for the armed forces.

Through intensive research and new technical developments, the paper industry is playing a major part in contributing to the war program.

Rigid Government specifications demand the best paper attainable and Jones' equipment, too, is playing an important part in helping to produce the better quality to meet these high standards.

Jones

E. D. JONES & SONS COMPANY-PITTSFIELD, MASS.
Builders of Quality Machinery for Paper Mills

vetoed by Canadian and American government agencies, but conditions have so changed that an increase to $53 at an early date seems certain, while in some quarters the increase is even suggested to a $60 base. That an increase is likely is evident from statements made by government authorities in both the United States and Canada.

◆

CORRES. COURSE IN MS. PREPARATION FOR TECH. MEN

The Extension Division of the University of Wisconsin, Madison, has recently announced a new correspondence course, "Specialized Exposition," to fill the needs of the technical worker or of the professional man who knows his subject but may lack certain skills in writing about it to meet precise editorial standards.

As outlined, this course encourages original composition on topics related to a student's daily work, with the aim of providing effective training in preparing articles for publication, business letters, and reports. Emphasis is placed on proper organization and arrangement of materials, an effective professional style, the important points in paragraphing, punctuation, etc. Because the assignments relate to topics in the student's own field of interest, the training is designed to meet his specific technical needs.

◆

ROBERTSON-McCABE ON POSTWAR BOARD

Reuben R. Robertson, executive vice president, Champion Paper & Fibre Company, and Thomas B. McCabe, president, Scott Paper Company, are serving as members of the board of trustees of the Committee for Economic Development, the basic organization of which has been completed by American business men as their own postwar planning group. They face the task of assuring a satisfactory level of employment after the war, working on the premise that America must be prepared to provide approximately 55,000,000 jobs, 9,000,000 more than in 1940, as soon as possible after hostilities cease.

Establishment of the committee originated several months ago when Secretary of Commerce Jesse H. Jones called together a group of business men, including representatives of the nation's greatest business organizations. With the assistance of the nation's leading economists and actively supported by every federal agency concerned with postwar economic problems, the committee is now functioning under the general chairmanship of Paul G. Hoffman, president of Studebaker Corporation,who outlined the committee's program January 1, and announced personnel of several of its sub-committees. The board of trustees is composed of men chosen from all 12 Federal Reserve Districts and from small business as well as large. Carroll L. Wilson has taken leave of absence from his post as director of the Bureau of Foreign and Domestic Commerce of the Commerce Department to serve as the organization's executive secretary. However, the committee is completely independent, separately incorporated, and privately financed by business—its board is self-perpetuating and elects its own successors.

◆

NAVAL STORES PUB. PREDICTS UNION BAG EXPANSION

An expansion in the facilities of the Union Bag and Paper Corporation for the production of a great quantity of sulphate wood turpentine was recently predicted by *Naval Stores Review*.

Reports of the Bureau of Agricultural Chemistry and Engineering, U. S. Department of Agriculture show that production of sulphate turpentine, although it is still allowed to go to waste in a number of southern wood pulp plants, increased from 9,832 barrels in 1934 to an estimated 75,000 in 1942. Union Bag, which is figuring a great increase in its plant and its output of both wood pulp and paper, could produce a large quantity of the product, which the *Review* expects it will do. Deep interest in the matter of sulphate turpentine production was expressed by two recent visitors to Savannah, George E. Chisholm, director of public relations for Union Bag, and Fred L. Palmer of the Earl-Newsom Company, public relations counsel.

◆

GOTTESMAN FOUND. GIVES SCHOLARSHIP

A scholarship valued at $800 per year for chemical research has been donated to the Pulp and Paper Research Institute of Canada by the Gottesman Foundation of New York. "The Gottesman Scholarship," as it will be called, will be tenable for one year and will be open to any American or British subject who is a graduate of a recognized university.

The Gottesman Foundation was established by Mr. and Mrs. D. Samuel Gottesman to manage a trust fund created by them, and to distribute therefrom funds exclusively for charitable, scientific, literary, educational, and religious purposes. Mr. Gottesman, president of Gottesman and Company, Inc., has for many years been intimately associated with the pulp and paper industry of both the United States and Canada, and has always displayed an active interest in the technological advances of the industry. The foundation has established scholarships at the Institute of Paper Chemistry, Appleton, Wisconsin, and now at the Pulp and Paper Research Institute of Canada.

The joint administrative committee of the Institute will arrange for the selection of the candidate by McGill University on the recommendation of the appropriate university department. The successful candidate shall perform work in any branch of chemical research in and under the direction and supervision of the Department of Chemistry of McGill University, subject to the approval of the joint administrative committee of the Institute. As the session at McGill has already begun and it is impossible to find a candidate by the usual procedure, the scholarship this year will be awarded to a student at present carrying work at the Institute.

◆

I.C.S. COURSE TO CO-OPERATE WITH CAN. MILLS

Plans have been made by the pulp and paper industry in Canada, in cooperation with the International Correspondence Schools Canadian, Ltd., to offset the present scarcity of skilled workers depleted by the war.

Due to varying conditions at the different mills, no rigid plan for training has been adopted. Where government trade schools are available, full use has been made of their facilities, otherwise training is carried out through co-operation of the I.C.S. course and practical training in pulp and paper industry machine shops.

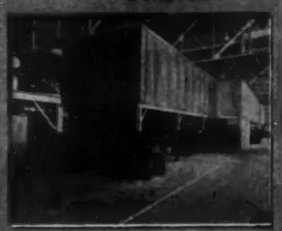
The I.C.S. course gives direct theoretical training. Except that subjects must be completed to the satisfaction of the I.C.S. examiner within a period commensurate with completion of the course within the year, there is no time schedule. Rate of learning, otherwise, depends upon the student. In conjunction with this theoretical training, practical training in the industry's machine shops is given. Men are put directly on jobs for which they are being trained. If this is not possible, they are required to attend practical courses at night.

A long way from paper mills to armament plants but—

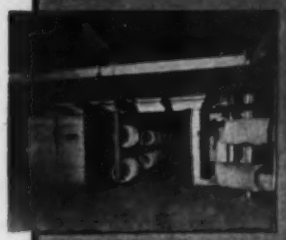
One-pass Tunnel Oven in Automobile Plant

Impregnating Heat Treating Oven in Air Plane Engine Plant

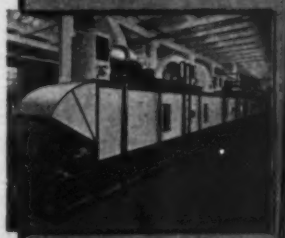
Controlled Humidity Dryer in Drug Plant



Continuous Core Oven in Magnesium Foundry



Wing Baking Oven in Steel Mill Aisle



Metal Lithographing Oven in Can Manufacturing Plant

Conditioning Oven in Rubber Mattress Plant

Core Oven and Conveyor in Aluminum Plant

Our background and experience accumulated over many years of air handling for paper mills, then for high and low temperature drying, baking and heat treating for metal industries made us ready to contribute mightily to the war effort.

Right now we are handling the largest volume of work in our entire history—building ovens, dryers and air handling systems for the production of aircraft engines and parts, ammunition, shells, ships and steel, guns and cannon, jeeps and tanks—and even food. Sorry, we cannot say whose plants these are, but a list would read like "Who's Who" in Airplane and Armament Plants.

Although our facilities for building and installing are being strained to the utmost, our services are available to Paper Mills who require systems for producing high priority war work. We are also anxious to give every assistance to our customers in maintaining their present equipment to secure from it the longest life and most efficiency. We will gladly give engineering help in developing advanced methods for the period after Victory, consistent with the time required for our vast volume of highly necessary war work.

We're "All-Out" For Victory!

All Ross Workers are giving liberally of their skill, time—and money. Not 90% but 100% of all our employees in offices and shops are purchasing War Bonds amounting to not 10% but more than 10% of our entire payroll.

* * * * *

Buy More War Bonds! Collect More Scrap! Conserve Materials!

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Main Office — 350 MADISON AVE., New York, N. Y.

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ROSS ENGINEERING OF CANADA, LIMITED, Dominion Square Building, Montreal

UNION BAG SELLS EQUIPMENT FROM 2 NEW YORK MILLS

The papermaking machines and auxiliary equipment in the Allen and Fenimore paper mills of the Union Bag and Paper Corporation, Hudson Falls, New York, have been purchased by the Osborne Paper Mill Equipment Corporation of Fulton, New York. The mills were closed by Union Bag last September 25 (cf. The Paper Industry and Paper World, October, 1942, p. 684).

Mark Osborne, president and treasurer, stated that the machinery was purchased by his concern for dismantling and disposal and had to be removed from the buildings within three months. Dismantling of the equipment was started December 14, and it is expected that from 20 to 50 Hudson Falls men will be given employment in the undertaking. It is understood that the buildings will remain intact for the present. The value of the equipment or amount involved in the transaction was not revealed.

◆

CANADA UTILIZES IDLE MACHINE SHOPS

Machine shop facilities of various pulp and paper mills in Canada, formerly comparatively idle, are now being utilized in making standardized parts of ships, ordnance, airplanes, and other confidential war devices.

A plan had been formed considering the call from all parts for trained machine mechanics, the thinning of shop staff by the loaning of skilled men to other industries, sub-contracting in parts for later assembly. Active work started in the summer of 1941. To date, some million dollars of standardized parts have been manufactured; and over 1,500 trainees have been enrolled, many of whom have gone out to other plants, the openings left being quickly filled by new registrants. At the Pulp and Paper Association's convention last spring, an entire corridor was filled with specimens of work, some completed by mere lads under the direction of older and more competent machinists.

◆

POWELL RIVER CO. SERVICE MEN HOLD REUNION IN ENGLAND

From London, England, has come a report of a reunion of all former employees of the Powell River Company, Powell River, British Columbia, now in active service in England with various units of the armed forces. The reunion, attended by 71 men, is believed to be the first organized reunion of any group from any special area or any group of employees from any special company on active service in Great Britain.

Corporal Schon, now with the R.C.A.F., originated the idea. He contacted Canadian officials in London, interviewed the staff at the Canadian Beaver Club, and arranged for special entertainment. The Powell River Company sent air mail letters to commanding officers of overseas units asking for their cooperation in arranging leave for the men. The company also contacted every former employee known to be in England. Only a very small number were unable to attend.

◆

KVP ADDS NEW PAPER MACHINE

Installation of another papermaking machine at the Kalamazoo Vegetable Parchment Company, Parchment, Michigan, is now in progress and is expected to be completed in February or March, according to KVP officials.

Papers for war use are now being produced in the Parchment mill. In addition, KVP is one of several Kalamazoo Valley mills to convert their machine shops to war use by turning out numerous small metal articles for fighting equipment.

◆

CAN. MANAGEMENT AND LABOR MEET— DISCUSS MANPOWER

Spokesmen for leading trade union organizations pledged the co-operation of labor in restriction of operations and switching of manpower to the most essential wartime industries at a general conference of Canada's pulp and paper industry held recently in Montreal, the only stipulation being that labor groups be taken into the complete confidence of both employers and the government agencies concerned.

The conference was attended by nearly 300 representatives of employing firms, management executives, and trade unions, and Elliott M. Little, director of National Selective Service, made an appeal to both labor and management in the industry to work together to arrive at a broad understanding of the National Selective Service regulations and the demand on the country's manpower. The program under consideration is aimed at reducing the industry's power consumption, curtailing operations in areas where power is required by essential war industries, and diverting manpower to other industries such as logging and lumbering.

Briefs . . .

▸▸▸ THROUGH THE CO-OPERATION of the Powell River Company, Powell River, British Columbia, 150 tons of scrap metal recently were moved to Vancouver by the Powell River Branch of the Canadian Legion. The company provided a scow, tow, crane, and crane operator for the job.

◆

▸▸▸ DONNACONA PAPER COMPANY, LTD., Donnacona, Quebec, has received permission from the Quebec Provincial Government to lower the level of Lake St. Joseph, near Donnacona, by 5 feet this winter. With the extra water supply from the lake, which will be lowered by about an inch a day, the company will be able to increase power production and give employment to a number of men. The company has agreed to have the water level back to normal for May 15.

◆

▸▸▸ THE CANADIAN ADMINISTRATOR of paper boxes, envelopes, and packages issued an order, effective November 19, 1942, limiting the number of sizes and weights of paper used in the manufacture of paper bags for various commercial purposes. However, paper bags in process of manufacture on that date could be completed. The order will economize on skilled labor, and, with fewer sizes, larger proportion runs can be obtained, reducing the idle machine time caused by changing of sizes.

◆

▸▸▸ THE FIRST UNIT OF Canada's largest single hydropower development has started running, and the second unit is expected to be ready shortly. The huge Shipshaw plant of the Aluminum Power Company is also expected to be in full operation before long. On December 5, the hydraulic portion of the development on the Saguenay River was completed when almost 100,000 pounds of explosive removed the remains of what had once been a sizable hill separating the river and power house.

That's right, a sponging is good for the life of your super-calender rolls. Give it to them often but use the wetting agent sparingly. It's the proper treatment for keeping rolls clean and for reducing markings. Avoid sanding if possible, it spoils the surface finish. Baby your rolls through these war days. Give them lots of care and attention and they will give you longer service. New rolls are hard to get but we can supply you with new fillings that are just right on your rolls for your papers on your super-calenders. Then too, shipping is something of a bottle-neck. Look over your roll situation and send us the ones that need refilling now, then you will have them on hand when you need them.

THE APPLETON MACHINE COMPANY
APPLETON · WISCONSIN

▶▶▶ TWENTY-THREE MEN AND WOMEN with service records of from 3 to 30 years were honored for service at the Hammermill Paper Company, Erie, Pennsylvania, recently. Those with 20 years of service received gold watches or shares of company stock, as well as service honor roll diplomas.

◆

▶▶▶ PLANS FOR A NEW ADDITION to the Toronto, Ontario, mill of the Gair Company of Canada, Ltd., have been approved, and work is being placed under way. The general erection contract has been awarded to Russell Construction Company, Ltd., Toronto.

◆

▶▶▶ SIX FRENCH-CANADIAN and 15 Indian women are now working as pulpwood cutters for the Arrow Land and Logging Company in camps near Hearst, Ontario. "Some of them are just as good as men and are able to cut a cord of pulpwood a day," said a company official.

◆

▶▶▶ A WAREHOUSE OF the New Haven Pulp & Board Company, New Haven, Connecticut, in which bales of scrap paper and rags were stored ready for shipment, was the scene of a two-alarm fire on December 14. An unofficial estimate of the damage was set at $5,000, and stubbornly smoldering bales of paper forced firemen to remain at the scene for nearly eight hours. The cause of the blaze was unknown.

◆

▶▶▶ ON DECEMBER 31, The Pejepscot Paper Company, Brunswick, Maine, announced that it would no longer manufacture standard newsprint paper. It was stated that the company has plans to increase its manufacture of groundwood specialty papers and the facilities and labor formerly devoted to the manufacture of newsprint will now be used for its specialty products.

◆

▶▶▶ THE MACHINE SHOPS of Powell River Company, Powell River, British Columbia, are now working on a contract for corvette lubricators in connection with the bits and pieces program of Canada's war industry. The contract is a small one and is largely in the nature of an initial test of the equipment. It is believed that the shop facilities will be used more and more extensively in this type of work in the future, and an additional night shift is to be started on war orders soon.

PQ SILICATE AID
Increase yield by Correct use
"We've found" say paper mill operators, "that we get increased yield by precipitating PQ Silicate in the beater with alum at 4.6 pH." When more of the silicate is retained, it is measured by a higher ash content of the finished sheet (see chart below).
Thus these mills also get better quality paper. PQ Silicate helps to improve the finish and strength, also to increase rosin retention. Get more facts from PQ. Write for Bulletin #61.
PQ SILICATES OF SODA
Philadelphia Quartz Co. Manufacturers of Silicates of Soda
General Offices and Laboratory: 125 S. Third Street, Philadelphia, Pa.
Chicago Sales Office: 205 W. Wacker Drive. Stocks in 65 cities.
ASH IN PAPER
75% SULFITE
25% GROUND WOOD
SODA PULP
pH

▶▶▶ A $100,000 THREE-ALARM FIRE recently broke out at the Great Lakes Paper Box plant in Cleveland, Ohio. Cause was not determined. The fire started on the second floor of the plant, and 100 employees working there attempted to extinguish the flames; however, fire quickly spread into the storage room and wastepaper and boxes were ignited. Ten fire companies answered the alarm, and firemen worked three hours before bringing the blaze under control.

◆

▶▶▶ SETTLEMENT OF THE DIFFICULTIES of the Quebec Pulp and Paper Corporation, Chicoutimi, Quebec, will have the aid of the Province of Quebec, according to a statement by the Honorable Wilfred Hamel, Minister of Mines and Forests for the province. The province has a claim of $1,800,000 against the bankrupt company, and Mr. Hamel told representatives of the preferred shareholders that the government was just as anxious as they were to settle its affairs.

◆

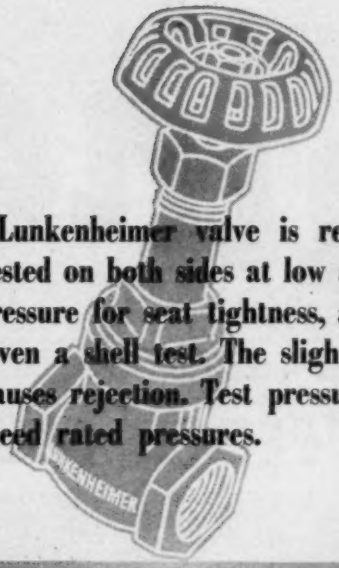
▶▶▶ FLAMES STARTED apparently from spontaneous combustion in a powdered-coal shed threatened to destroy the Norfolk mill of the St. Regis Paper Company December 24, and caused damage amounting to several thousand dollars. Prompt action on the part of the Norfolk Fire Department, many members of which are employed at the specialty mill, was credited with having prevented a far more serious loss, if not total destruction of the main building.

◆

▶▶▶ MORE MEN AND MORE WOMEN are being utilized in various departments of the pulp and paper mill of the Powell River Company, Ltd., Powell River, British Columbia. To date the beater room, sulphite plant, and finishing and pulp testing departments are all providing employment for a number of women. Miss Mary Cavanaugh, who took over a position as pulp tester, was the first woman to be employed in this plant.

◆

▶▶▶ WAGES FOR WOMEN WORKERS in pulp and paper mills in British Columbia have now been increased. A starting rate of 50 cents per hour for women workers in mills at Powell River and Ocean Falls has been approved by the Regional War Labor Board, and applies to women being taught a job and to those working on modified men's jobs. In all cases where women perform work equal to men, the job rate will apply.



Every Lunkenheimer valve is regularly tested on both sides at low and high pressure for seat tightness, and then given a shell test. The slightest leak causes rejection. Test pressures far exceed rated pressures.

But The Final Test of a Valve . . . is Performance

How does it hold up in service? Does it stand the gaff of hard usage? Is it dependable? Is it economical to use? How does it stack up in lasting qualities? The answers to these questions are the final and only convincing test of a valve. Ask any production man.

Now, when performance is more important than ever, when unnecessary time out for repairs is waste, and new valves aren't so easy to replace, valve users are profiting from their foresight in buying Lunkenheimer.

Rigid testing procedure is but one of the many precise steps in manufacture by which Lunkenheimer has maintained valve quality through the years. These steps are your assurance that Lunkenheimer Valves will give you more in uninterrupted performance for today's non-stop production schedules.

Since virtually all materials used in the manufacture of valves are on the list of critical materials, valve users are urged to furnish the highest possible preference ratings and proper "end use" information on their orders. This will be of mutual helpfulness.

ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI, OHIO, U. S. A.
NEW YORK CHICAGO
BOSTON PHILADELPHIA
EXPORT DEPT. 318-322 HUDSON ST., NEW YORK

LUNKENHEIMER VALVES

Stamina

. . . when IT'S NEEDED MOST!

These are days when breakdowns are a serious threat to paper mill production. Breakdowns, with subsequent repairs and replacement parts, can result in long delays. . . . That's why mill operators rely with satisfaction on Buffalo Full Ball-Bearing Paper Stock Pumps. Their in-built stamina—their ability to carry on in the face of severe demands and the wear and tear of sudden changes in stock consistency—today make Buffalo Pumps prized equipment throughout the paper industry!

ARMY E NAVY

BUFFALO PUMPS, INC.

213 Mortimer St. Buffalo, N. Y.

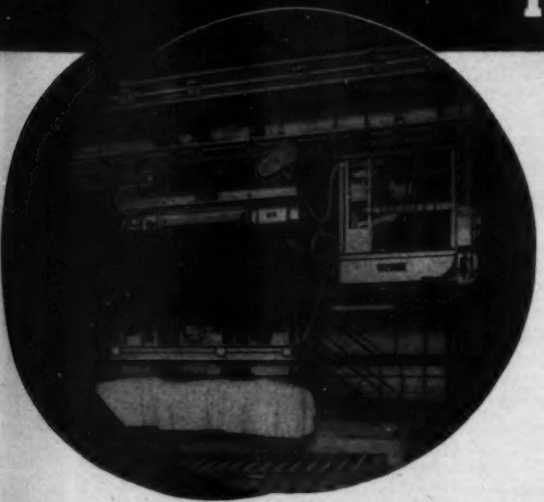
Branch Engineering Offices in Principal Cities

Canada Pumps, Ltd., Kitchener, Ont.

"Buffalo" PAPER STOCK PUMPS

This pulp handling system is hand-propelled with electric hoists. By means of interlocks all sections of the system may be connected, thus permitting the pulp to be moved directly to destination without rehandling.

HANDLE PULP the OVERHEAD WAY
FAST! ECONOMICAL! SAFE!



Three bales are picked up at a time with this patented Cleveland Tramrail screw grab. Motor-driven screws secure and release bales without operator leaving cab.

More pulp can be handled in less time with a Cleveland Tramrail overhead system. The usual hard manual work can be greatly eased and safety bettered. Costs can be reduced considerably.

Cleveland Tramrail is built for hand or electric operation. The pulp storage room shown above makes use of easy rolling hand-propelled cranes equipped with electric hoists that do the heavy lifting. Where a completely electrified system is desired, a motor-driven screw-type grab as illustrated at left will speed handling tremendously.

When pulp is transported overhead, all troubles of floor interference are eliminated. Aisles need not be provided and the space thus saved can be used for storage. Bales of pulp can be piled higher. Thus storage capacity of a room can be increased greatly.

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THE CLEVELAND CRANE & ENGINEERING CO.
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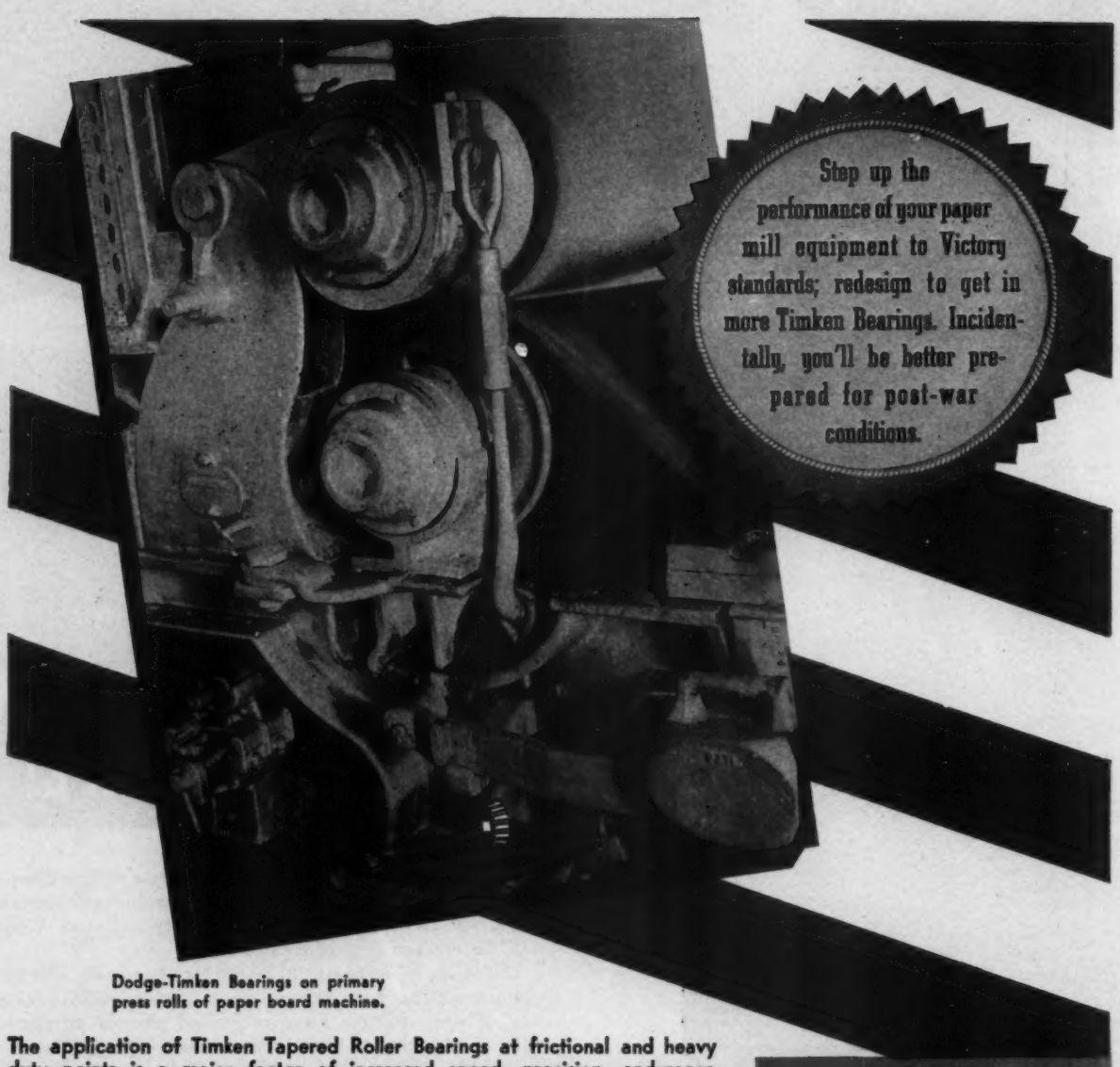
CLEVELAND TRAMRAIL

OVERHEAD MATERIALS HANDLING EQUIPMENT



Step up the performance of your paper mill equipment to Victory standards; redesign to get in more Timken Bearings. Incidentally, you'll be better prepared for post-war conditions.

Dodge-Timken Bearings on primary press rolls of paper board machine.

The application of Timken Tapered Roller Bearings at frictional and heavy duty points is a major factor of increased speed, precision, endurance and economy in paper-making equipment of all kinds — from jordan engines to supercalenders.

It's surprising how great an improvement even a few Timken Roller Bearings make in machine operation through reduction of friction and wear; control of radial, thrust and combined loads; and prevention of misalignment.

When these benefits are multiplied by the use of Timken Bearings at every suitable position, performance reaches its peak; operating and maintenance costs sink to new low levels.

Engineers who consistently make maximum use of Timken Bearings in the machines they design are of greater value to their companies because they give them *better* machines and—what is equally important—*better selling* machines; for no name in bearings makes such a favorable appeal to machine buyers.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

"All There Is In Bearings"

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

HELP ASSURE VICTORY

Buy War Bonds. Conserve Rubber. Eliminate Unnecessary Travel. Use the Telephone Only When Important. Salvage All Scrap and Waste Material.

All Timken Bearing production now goes into fighting machines. However, the Timken Bearings in your motor vehicles or industrial machines will see you through the emergency—and beyond it—if you make sure they are lubricated and inspected regularly.

Editorial

1943 Paper Potentialities

▸▸▸ FROM THE INNER SANCTUM at Washington comes evidence of a "new conservation order" to start activities along the war front of the paper industry for the 1943 campaign. The order is said to be scheduled "for issuance within the next few days." In substance, it stacks up along the following lines:

A new base period is to be set up. The present operating schedule is based upon production during the period of April 1 to September 30, 1942, inclusive. That was a real, limiting production order, as the base period included all the vacation and lowest production months of last year.

The prospective base period is said to consist of the last quarter of 1941 and the first quarter of 1942. This period covers about the highest production period the industry has ever known, and so far as we can reckon at the present time, it would permit an over-all increase in production of at least 10 per cent. On the face of it, it would seem to be a belated recognition by the paper planners at Washington of the essentiality of paper products in the campaign for winning the War. However, such is not the case. For the production of paper products does not depend upon the statistics of any period, but does depend upon the supply of the essential raw materials and manpower, plus other operating conditions conducive to the all-out use of the industry's equipment.

The outstanding requirements for the all-out production of paper products is an adequate, continuous supply of pulpwood. And, today, North America, and particularly the United States in which are located the largest installations of pulp converting machines in the world, faces a drastic shortage.

To produce steel, the mills must have an adequate, continuous supply of iron ore, and the WPB has gone to great lengths to see that the supply of iron ore is made certain for steel mill operations.

To produce paper products, the mills must be assured of an adequate and continuous supply of pulpwood, but unlike the steel situation, the War Board has made no plans for supplying the pulpwood to the paper mills. Or is this no oversight at all, but the old familiar "we planned it this way?"

Now, the WPB knows all about the pulpwood shortage. Already it has issued the factual statement that "the pulpwood supply for North America available in 1943 is estimated at 20,000,000 cords compared with 25,000,000 cords in 1942."

Here we have a War Board estimate of a 20 per cent reduction in the supply of the essential raw material without which paper cannot be produced. So, the Board's proposal to the paper industry for 1943 is just this: We give you a 10 per cent statistical increase in paper products' volume, and hand you a raw material decrease of 20 per cent, a wholly inoperable and unadministrable premise. One cannot manufacture paper products out of statistics.

Eminent authorities have said that the nation or nations controlling the forests and their products will win the War. Paper products are primary forest products. They are indispensably essential to the winning of the War. The paper industry has not been recognized as essential to the War economy, and this last "conservation order," if ever issued, shows no indication of appreciation of that fundamental fact.

Unless immediate steps are taken to make certain the continuous flow of pulpwood to the mills of this country, a critical, crippling shortage of paper products will certainly face the Nation during 1943.

Building for Tomorrow

▸▸▸ IMMINENT AS NUMEROUS PROBLEMS of the moment are, no problem confronting the pulp and paper industry is more important than that concerning postwar activity. The pulp and paper industry like every other industry, when the war is over, will be faced with situations much different probably from any ever experienced before by modern industry.

It is not possible to state what form these situations may take. Things happen so rapidly these days that the development of a new situation, possibly unexpected or unforeseen by even the most capable observers, changes the aspects of a problem at hand before being able to work it out.

By being prepared, however, situations that might otherwise cause confusion and even catastrophe can be met with alacrity and insight.

The individual pulp and paper mill organization which has any thought of being in business when the world is at peace again should work at greatest possible efficiency today and at the same time plan for tomorrow. In any planning program for the future, consideration must be given to three factors that seem to stand out beyond any others which come to mind. These factors are: Possibility of Technological Changes; Market Changes; and Manpower Assimilation.

Consideration of these factors offers a challenge to every individual in the industry. Now is the time to gather ideas and to culture them. Many of the ideas, gathered from Tom, Dick and Harry, will be sterile and can be cast aside quickly. Some of them, however, should be virile, and a real contribution to the industry.

If the industry continues to develop as it has in the past quarter of a century there probably will be an array of new products, improved papers of existing grades, and some newly developed uses for paper as well as perhaps pulp fiber awaiting postwar market introduction.

Research workers, engineers, production executives, mill operatives, management, and sales personnel should be contributing their all to this effort. Success in it will permit the industry as a whole to assimilate its just share of manpower that must be absorbed by industry and business when world activities return to normal, and likewise will assure the future well-being of the industry.

WHY MUST WE ALWAYS BE SO RADICAL?

WILLIAM SIBLEY

▶▶▶ WHEN THE WRITER went to France as a soldier of World War I, he was rather early in the "game" and so saw considerable of France and was priviliged to make friends with many French people, from peasants to the rather wealthy.

Among those friends was M. Lieutenant Signieure, a chap about 35, and one who in private life had been the equivalent of our Certified Public Accountant. Having studied at Oxford in England, he spoke far better English than I could muster, and being a devotee of both human nature and literature we became fast friends.

Here is just one of his observations regarding the Americans, which, if he but knew it, reflected itself as a truism against the entire social structure of this nation. He said: "When the British Tommies came over to help us, during the early days of the war, we French wondered just what sort of chaps they would turn out to be. . . . We didn't have long to wonder. We found them, as a whole, a bunch of healthy boys who were extremely fond of our wines and cognac. They were drinkers. . . . Then when the Canadians came over, we wondered again what sort of men they would prove to be. And again we didn't have long to wait. The Canadians proved to be most active in running after our mademoiselles. . . . Then, for the third time, when the Americans came over, during 1917, we wondered what sort of fellow the typical American would be. Very presently we knew. He was both!"

That is certainly characteristic of the American people. We never do anything by halves. We are intemperate in what we do, or even in what we think. There are no halfway points for Americans.

No historian, up to date, and probably none for generations will be accused of assigning the adjective "temperate" to the American race. And such intemperance costs us a lot of progress; a lot of money. Why must we always be so radical?

The present world conflict has imposed on all peoples a diet of sacrifice unparalleled in history. Taxes, everywhere, are at hitherto unimagined levels, and necessarily so. About a year ago we Americans were shocked to learn that in England no citizen could earn for himself, after taxes, more than $25,000 per year for a living wage. We thought, at that time, such restriction incredible.

In England, the restricting living wage measure in no way threatens the maintenance of insurance protections, charities or personal obligations. The English, very wisely, have so arranged their tax schedule that no citizen can *retain* more than 5,000 pounds for the living expenses of his family. What a citizen donates to charities, educational institutions, philanthropies, or previously assigned personal obligations, may be made over and above that amount. The British also have set up a tax schedule which in no way penalizes or kills individual or corporate incentive.

But here in America we, quite characteristically, go whole-hog, and enact a law which prohibits any citizen keeping, for whatever purpose, more than $25,000 per year. And that sort of enactment holds high promise of being one of the most devastating acts of all time. With a ceiling of $25,000 on earnings, after taxes, where is the man who can continue his endowments to small or large colleges or universities? What are our churches and world-flung missionaries going to do for donations? What will happen to the American Red Cross, the Salvation Army, the hundreds of community funds, the thousands of hospitals and clinics all of which must depend, most largely, upon free-will donations? Certainly, with the passage of this law, privately supported philanthropies and educational institutions will lose indispensable support, then wane, then vanish. But the proposed bill will do far more than this, which is bad enough in itself to merit the immediate demise of the entire idea. For such a law to take effect would result in several developments:

A) Investors, and those whose jobs, pensions and service allowances depend on the income earners will all suffer greatly. Indeed, they are suffering already from the effect of even the proposal.

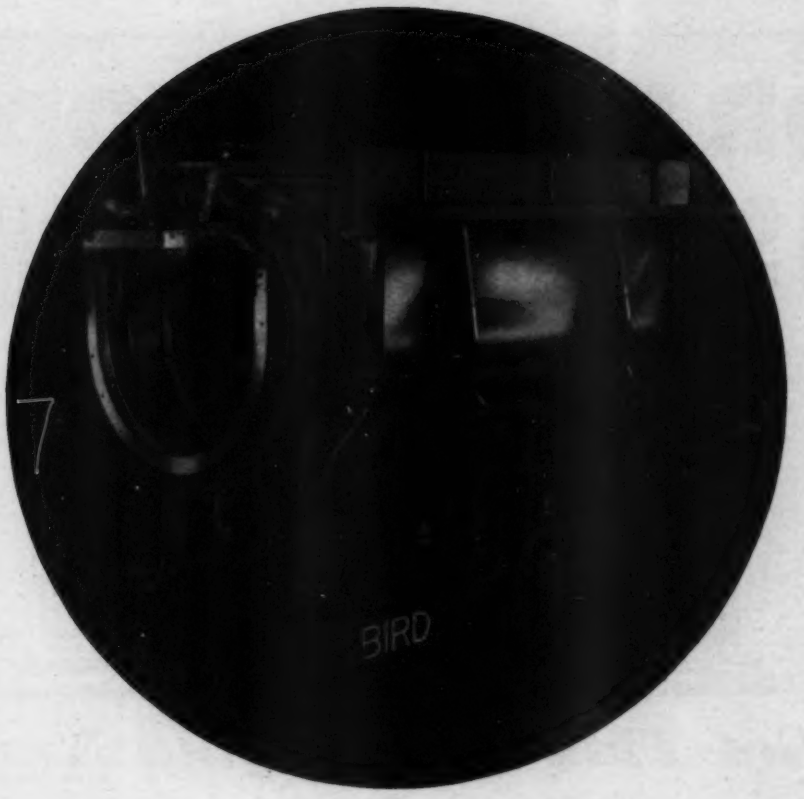
B) Personal incentive in the shape of personal profits is largely responsible for the growth of this nation. Without the incentive of profit, insurance budgets and endowment protections will be more than endangered, they will become largely a thing of the past.

C) Its full exercise would give rise to another army of bureaucratic workers who, at public expense, would be necessary to police the order.

D) Any employer who would like to leave a larger than $25,000 income to another employer, or partner, either at his own or the corporation's expense, places both himself and his assigned beneficiary under the stigma of committing a criminal act.

Whether or not the fact that this $25,000 limitation idea was first found in the Communist platform of 1928, some fourteen years before it received the endorsement of the C. I. O., Mrs. Roosevelt, the family of the President and some of his aids is beside the point. What really matters is that once made permanent, it could prevent a minority party from ever raising a campaign fund sufficiently large to carry its message to the nation through all of the costly channels of publicity now employed by the majority parties. Perhaps even more important would be the quick demise of many small colleges, community chests, philanthropies, and organizations now working in the welfare of the public. It would mean good-by to the majority of the nation's symphony orchestras, and farewell to most of the social centers.

It is not sufficient that James F. Byrnes, Director of the Office of Economic Stabilization, should assure the nation that this plan is self-extinguishing in 1944. . . . Just when did *any* Administration, New Deal or otherwise, willingly and freely drop or abandon a "reform" it had instituted, once it had been established? Unemployment, default of fixed family and personal obligations, dried up charity and educational gifts, and a brake on personal incentive are the natural concomitants of this idea. Let's kill it before it gets started. . . . For once in our lives, let's be temperate, and take lessons from England who has had a successful experience with the same idea, over a much longer period of time.



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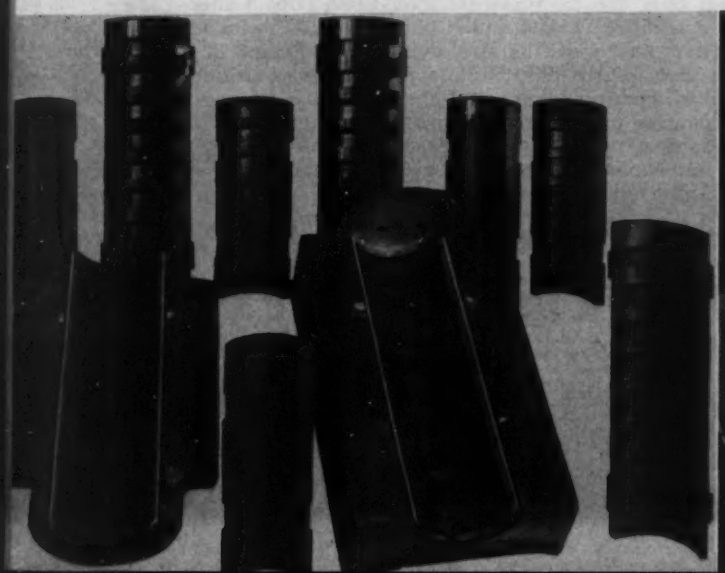


Hazards in Paperboard Mills *and* Converting Plants

S. S. KNISELY, Mechanical Engineer
The Hinde and Dauch Paper Company

▶▶▶ THE PRINCIPAL MATERIALS employed in the manufacture of paperboard are wastepaper, woodpulp, straw, and chemicals of various sorts. The wastepaper of whatever grade, such as newsprint, wrapping, book, discarded boxes, or broke from fabricating plants, usually is collected by the neighborhood junk dealer and sold to waste broker, or direct to a mill. In any event, the paper reaches the board mill by means of truck, or train in the form of wire bound bales of a size approximately 72 in. x 32 in. x 28 in. and weighing from 500 to 1,500 pounds.

Handling and Storage of Fibrous Raw Materials

The hazard, or lack of it, in connection with the handling and storage of such bales at the mill depends to a large extent on the type and condition of the equipment provided for that purpose. Whether the bales are stored in a warehouse, stacked in an outside rick adjacent to the mill, or transferred directly to processing equipment, it usually is necessary to lift them from the common carrier by means of some power driven equipment, such as a tractor crane equipped with a long grip or grab. The same equipment may be used for stacking, or a flight conveyor, or traveling crane and hoist might be used for the operation. Regardless of the equipment employed in unloading and storing, some handwork is necessary in positioning the bales for the transfer from the common carrier to the pile and in placing them properly in the stack.

An employee doing this work should be strong and husky. He also should be agile, alert, and sensible enough to make the best use of his physical strength. Then, by exercising proper skill and co-operative teamwork with other members of his gang, the huge bales may be handled with comparative ease. Serious muscle strain and undue fatigue would be experienced by any workman who depended upon physical strength alone to move the bales. Such a worker also might cause injury to a fellow employee or to himself by allowing a bale to fall unintentionally or by the careless handling of a bale hook.

Woodpulp and straw are delivered to a mill and handled in much the same way as wastepaper, except that the respective bales are not as heavy. Pulp bales weigh approximately 500 pounds each; straw bales, about 100 pounds.

To avoid the collapse of a rick or stack of bales, great care must be exercised in making the pile. It is possible, because of the similarity in size and shape of a given kind of bale, to bind such bales in a stack through proper placement of each bale in a tier.

The mill yard of a strawboard mill, shortly after harvest, may contain a number of ricks of baled straw, sometimes individually as large as 200 ft. long, 40 ft. wide and 30 ft. high. Each pile must be built as compactly as possible, and sufficient aisles or driveways must be left in the grouping arrangement to facilitate the breaking down of the individual pile and to fight fire, should the occasion demand.

A fire in a straw stack or in a wastepaper stack may result in a loss of many thousands of dollars. For this reason, no stack should be built too large. In the author's opinion, the dimensions previously given are much too large and should be reduced in half if proper protection is to be maintained. Likewise, if the paper stack or straw is confined under a roof or in an enclosed warehouse, it should be protected by an automatic sprinkler system. Also, if in a warehouse, a ventilating system should be provided to prevent spontaneous combustion and to relieve unhealthy dust conditions.

A traveling crane or tramway provides the most convenient means of delivering the bales from storage to the cookers or heaters. Such equipment almost eliminates the necessity of manual handling with its potential hazards. If such equipment is not available, probably the best procedure would be to remove the bales from the stack with the same equipment that was used to place them in storage, and then to load them on truck or trailer for delivery to the processing department. This procedure increases the accident hazard somewhat because of the more manual handling it involves.

Sometimes it may be necessary to transfer the bales to the initial production operation with a two-wheeled hand truck operated on a platform, runway or ramp. Again the hazards are increased, the worker's skill playing an important part in avoiding falls and strained muscles.

Rotary and Beater Room Hazards

In the cooking of straw, the bales usually are opened on a platform below the charging floor and then the straw is delivered to the charging floor by means of a flight conveyor. The cutting of the wires from the bales and the disposal of the wire after removal from the straw is fraught with the danger of scratching or cutting the hands or of injuring the eyes and face with the discarded wire. Similar injuries also may occur when opening bales of wastepaper or pulp.

Injuries of this kind may be avoided by exercising proper care; but, should they occur, they should be treated without delay to avoid infection.

Lime, soda ash, alum, size, and color present no difficult handling problem.

Yet, any scratches, cuts, or skin abrasions resulting from such work should be treated immediately if the danger of serious infection is to be minimized. This same precaution should be followed in the handling of wastepaper.

Another hazard often noticed in rotary and beater rooms is the leaving of stock hooks, forks, rakes, and other tools in aisles or on catwalks or stairways to be stumbled over. Careful workers do not leave their tools around in this way; so it is a hazard that can be avoided easily.

Vigilance and faithful observance of the rules of good housekeeping are required to keep rotary rooms and beater rooms clean and safe. Litter from open bales, cooked or partially beaten stock, and puddles of water can make the floors of these rooms very untidy and hazardous if good housekeeping is not practiced.

The same sloppy condition may exist around stock pumps, agitating chests, jordans, screens, and the wet end of the machine. The use of a water hose and an adequate floor drainage is essential if these areas are to be kept sanitary and in workable condition. As a further protection against injury from slipping, rubber boots or safety shoes with non-skid soles should be worn around this equipment.

Safe Practices Required Around Paper Machine

The dryer section of the paperboard machine should be provided with ample and well-guarded runways or catwalks for convenience in leading the web around dryers and in doing any other necessary work about them. All dryer gears should be guarded; and all steam pipes within reach of machine operators should be covered.

The handling of the sheet at the dry end of the machine requires dexterity and skill if physical injuries are to be avoided. A misstep or a stumble over broke might result in a strain or broken limb or even more serious injury. It also is possible to have the hands or fingers caught in the nips of calender rolls. Calender guards have been devised as a protection against this nip hazard, but up to the present they are not in general use.

Starting the reel also requires alertness and teamwork, and there is some danger of sustaining cuts in passing the web through the slitters to the rewinder. By exercising proper safety mindedness, however, the danger of injuries in these operations is somewhat remote, providing all driving mechanism is guarded adequately.

The rewound rolls, either jumbo or rolls of reduced widths, present a handling problem. These rolls weigh from several hundred pounds to two, three, or more tons. Some mechanical means, preferably power driven, is necessary to remove the heavier rolls from the rewinder and deliver them to warehouse, truck or car, or direct to subsequent operations. A substantial hoist of ample capacity to handle the heaviest roll is necessary for lifting. It might be part of an overhead crane or tramway system, or it might be used simply for placing the rolls on dollies or trucks to be hauled away.

The handling of the rolls involves the same hazards as the handling of heavy bales: namely, strained muscles and falls; but the more mechanical the operation, the less the hazards.

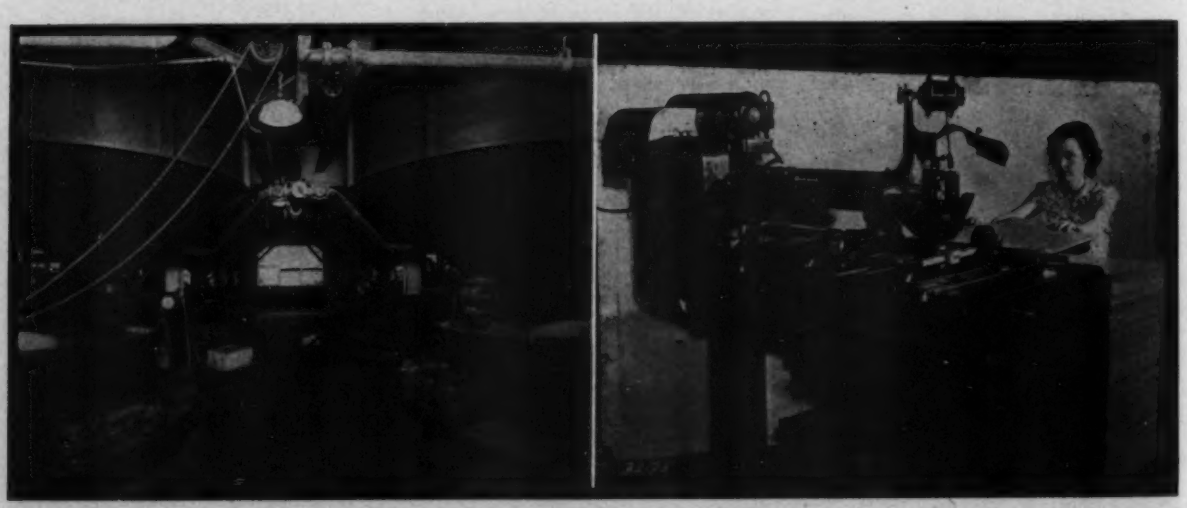
Some Safety Problems of the Converting Plant

The fabricating plant, specifically the plant manufacturing corrugated shipping boxes and other corrugated products, must carry many grades and sizes of paperboard. To facilitate the removal of this paper from storage requires conveniently arranged aisles.

Every pile of paperboard rolls must be firmly built and carefully supported to prevent possibility of collapse. If the rolls are stacked on end, they must stand squarely upon each other, preferably in such a way that they interlock and not sufficiently high to develop a tendency for tipping over or to create a floor load, especially if on an upper floor that doesn't allow for a good factor of safety. If the rolls are pyramided or tiered on their sides with planking between each tier, they must be held firmly in place with wedge-shaped blocks or chocks. Otherwise, there would be the danger of a pile collapsing into an aisle.

All equipment used for the handling of rolls, whether overhead crane, tramrail, electric truck, portable tiering elevator, or hand truck, should be kept in good operating condition. Any failure of equipment of this kind might result in injury to some employee.

A two-wheeled warehouse truck is almost indispensable in the roll room and in the corrugating department. It is the only materials handling equipment used in some plants for moving roll stock from place to place. Although it is a simple piece of equipment injuries are perhaps more likely to occur with it than with a crane or electric truck when handling rolls. Many times, when using such a truck, rolls must be dropped from an upper tier to the floor for loading. It is a rather strenuous job to tip these rolls, one at a time, onto the truck endwise, balance them in a wheeling position during transit, and drop them carefully upon a dolly or at a converting machine without damage. Considerable



LEFT—Beater room in paper mill revealing tidy operating conditions (Photo courtesy Dilts Machine Works). RIGHT—Automatic side seam stitcher in operation (Photo from Seybold Div., Harris-Seybold-Potter).

LEFT—Paperboard rolls in storage. Rolls piled on end to heights of 40 feet and higher (Photo from Cleveland Crane & Engineering Co.). CENTER—Dryer section of modern paperboard machine showing ladders and footwalk on tending side. Also note rope carrier arrangement for taking web of paper over the dryers (Courtesy Black-Clawson Co.). RIGHT—Unloading bales of waste paper from truck at mill (Illus. furnished by Shepard-Niles Crane & Hoist Corp.).

skill and strength are required on the part of such a hand truck operator if strains or more serious injuries are to be avoided.

As a further matter of good housekeeping, care must be taken to keep warehouse aisles free of dollies, planking, blocking, butt rolls, pieces of paperboard which may have been torn from the rolls, and of anything else which does not belong there.

In the corrugating and combining operations, slight injuries, such as strained muscles, scratches, or bruises, may be sustained in placing the rolls on the mounting stands. Severe cuts may be incurred in opening a roll with a hand knife preparatory to feeding the paper into the machine. It also is possible for the steel banding of the roll to snap open and cause a severe cut in the face or other part of the body, or even the loss of an eye.

Possibly the most serious injury that can occur in the corrugating department is when an operator gets his fingers or hands in the corrugating rolls while in operation.

The resulting injury is worse than that of being mangled by a tram of gears. Not only is the injured member crushed or macerated, but it also is subjected to a corrugating roll temperature of 330 Fahr. or more.

Steam piping connected to corrugating equipment should be insulated and guarded. Any steam leak developing in the pipes and fittings should be corrected without delay. These precautions are necessary if burns are to be avoided.

It is usual practice in a modern installation of corrugating equipment for an overhead bridge to be used to carry the web from one unit to another. This bridge should be well over an operator's head to insure free access around the machines. Because of this location, the bridge should be provided with a well guarded catwalk with convenient ladders or steps.

No bridge, catwalk, or steps should be utilized as a catch-all or storage space for loose objects. In fact, the entire department should be kept as neat and orderly as possible. If neglected, the corrugating room may become just as disorderly as a neglected beater room. The floor may become littered with scraps of paper, butt rolls, or smears of silicate or other adhesives.

A smear of silicate or paste on the floor is a slippery spot and should be cleaned up immediately. Otherwise, a serious injury from a fall might result. Usually distributed to the machines through a piping system, the adhesives present no serious hazard in handling. It only is necessary to maintain the system in good working condition.

The greatest problem at the delivery end of a double-backer is to remove the stock when loose ends or splices come through. A little too much haste in this effort may do a lot of damage if the attendant should get caught in the cut-off knife or in moving machinery. A similar hazard exists in subsequent operations where guillotine cutters or rotating choppers are involved: such as, in the sheeting of either double-face or single-face stock, in the sheeting of solid fiber stock or board for folding cartons and set-up boxes, and with ream cutters. Usually, all such machines are adequately guarded, but ingenuity and cool headedness on the part of the operator are quite essential at all times.

Good care and judgment are requisites for a slitter operator as a slitter knife will cut off fingers as readily as paperboard. The ordinary slitter can be guarded somewhat; yet the guard must be constructed in such a way as to be lifted readily to facilitate setting up the machine. Because of this operating problem and in spite of the hazard many slitters are unguarded, or, if guarded, may be operated without the guards in place.

Although rather massive and complicated, the modern slotting and printing machine, known as a printer slotter, is not hazardous to operate. Instances are known where workmen have been caught in the feed rolls or cylinders during a period when a machine was being set up or cleaned. Each of these accidents, however, resulted from the careless act on the part of some fellow employee who started the machine without warning and perhaps without permission. A safety switch or a starting button of the locking type would eliminate the possibility of such an accident.

In most plants, the folding of boxes preparatory to taping is done by hand, usually by female employees. Some employees may experience strained hand muscles or skin abrasions in this manual handling operation. Likewise, if the paperboard is not carefully handled, rather painful cuts may be sustained. Similar hazards exist in bundling and tieing, loading trucks, shipping, storing, and any other phase of work where considerable handling of the stock or finished product is necessary. In bundling and tieing, about the only other injury that might be sustained would be a knife cut, resulting from the improper handling of a knife in cutting the cord. Undoubtedly, the finger-ring knife is the safest knife to use for that purpose.

In recent years, the stitched box, both the corrugated and the solid fiber,

has come into considerable use. The ordinary run of these boxes can be stitched with automatic stitchers, but many special jobs require pedal operated machines. Automatic stitchers receive the folded blanks under a guard at one side and deliver the stitched boxes at the opposite side without an operator coming near a stitcher head. The operator of a foot pedal stitcher, on the other hand, usually a girl, may get a hand too close to the stitching head at the time of stepping on the pedal and in so doing insert a wire stitch in a finger instead of the box. Extreme care and alertness on the part of the operator are required if this sort of accident is to be avoided.

Saws are employed in some plants for sawing or cutting special products that cannot be handled by regular fabricating machines. Difficult to guard, these saws are dangerous to operate. Their use should be avoided if possible, and, when employed, should be used with discretion and care.

A separate room is recommended for sawing purposes to prevent dust from permeating the entire department. Where extreme dust conditions exist, the installation of an adequate dust collection system is essential. Likewise, the use of respirators is advisable.

Whether saws are operated or not, a good industrial vacuum cleaner should be available to the department and should be used freely to prevent any excessive accumulation of dust.

Die cutting is an operation which in recent years has become an important requirement in the production of corrugated products. The use of cutting and creasing presses is quite essential for forming irregular blanks that cannot be produced by regular slotting and scoring machines.

Some sort of die press is necessary for blanking solid fiber folding cartons or set-up boxes. Such a press commonly is well guarded, and is not nearly as hazardous as it appears when in operation. A touch of the hand guard on some of the modern hand-fed machines breaks the electric circuit, applies an automatic break, and stops the press instantly.

More injuries take place in stripping and handling die cut sheets than in feeding a die cutting press. The most prevalent of these injuries would include scratches, bruises, paper cuts, skin abrasions, and strains of hand muscles. Considerable bodily fatigue also may be experienced in this operation.

Any of these injuries, minor as they might be, should have immediate attention to avoid infection. There is always a certain amount of paper dust present and it is permeated with silicate or other chemicals. If the injured skin is not treated and protected against this hazard, infection is almost certain to follow.

Other injuries that may occur in the handling of paperboard may be caused by the tipping over of stock or the falling off of sheets and bundles from improperly loaded trucks, skids, or other transfer equipment. When loading a truck or skid, the piling should be done as compactly as possible. If the sheets are small or irregular, a binder sheet must be placed in the load to prevent it from collapsing. The same technique should be followed when finished products are stored or loaded for shipment.

To avoid confusion in transporting goods within the plant, a convenient aisle system is essential. These aisles must be kept free of empty trucks, tools, loose objects of any kind, as well as of trimmings, clippings, or other waste stock. Workmen must be able to move about and transport materials from place to place without danger of stumbling or of loads tipping over on them or on others.

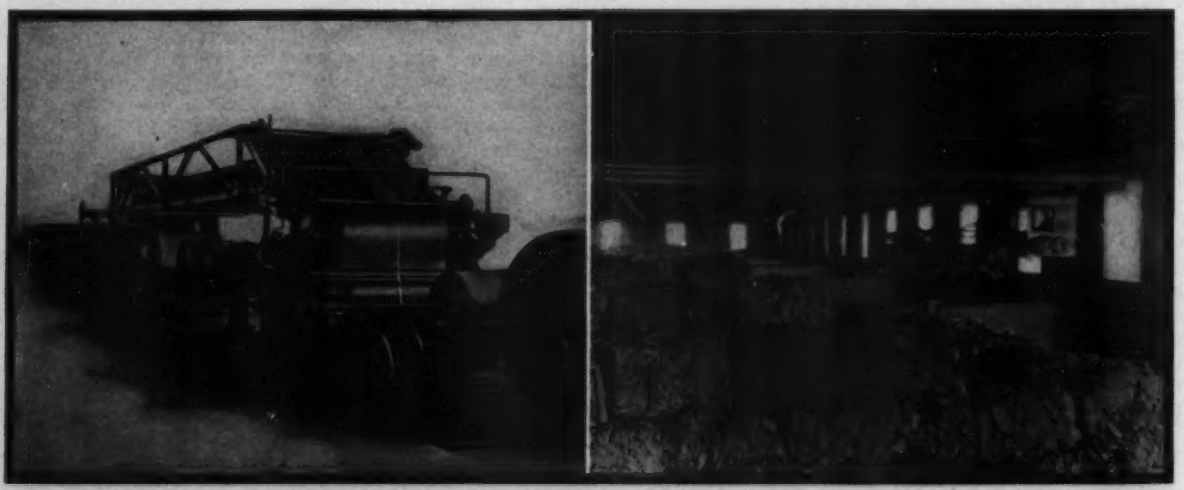
Clippings, trim, cut-out chips, and discarded blanks are much in evidence in connection with the fabricating process. All such waste stock must be kept away from converting machines and out of the traffic aisles. Usually, a porter is necessary in each department for carrying out this routine.

In disposing of this waste or broke, it is baled and returned to the board mill for re-use in the furnish. These bales should contain no extraneous materials of any kind because of their possible source of danger both to paper mill stock handlers and to processing machinery.

Watch Minor Injuries and Health Hazards

Accidents or accident hazards commonly are thought of in terms of loss of life or limb or other serious or permanent incapacitation. The less severe injuries, because of their seeming unimportance, are apt to be neglected or disregarded entirely. However, minor injuries, such as scratches, bruises, strained muscles, etc., as well as conditions that impair general health, often are as important as the more conspicuous injuries. If they are not treated promptly and properly, they can result in a loss of much time and can cause plenty of inconvenience and suffering.

All measures taken to prevent bodily injuries and to overcome health hazards will result in a considerable saving of manpower, greater operating efficiency, and a higher degree of contentment and happiness by the entire working force.



LEFT—78-in. combination corrugating unit (Photo courtesy Samuel M. Langston Co.). RIGHT—Bales of waste paper in storage. Note method of piling (From Shepard-Niles Crane & Hoist Corp.).

An Old Stand-by . . . SOAP

GEORGIA LEFFINGWELL and NORMAN RADIN

▸▸▸ THE PAPER TECHNICIAN must be on the lookout constantly for new materials and new processes to meet war emergencies, and it is a comfort to him to know that one of his tried and true allies is on the job. This ally is soap, an old stand-by whose usefulness to industry in general was never more apparent than today. The War Production Board has given no hint that we shall have to find a substitute for soap.

Soap is no stranger to the paper industry. Its emulsifying, dispersing, and lubricating powers long have been used in size preparations, coating compositions, de-inking processes, and others. The easy chemical reactivity of soap lately has been applied to the treatment of white water and to certain waterproofing methods. One of the more recent patents (*1*) calls for soap use in treating waste paper.

In this process, broken paper is macerated and stirred in a soap solution; the mixture is then diluted and floated. If necessary, the pulp is bleached, rinsed, and dried. De-inking of newspaper fibers may prove necessary; this can be done by forming a soap in the breaker beater (*2*), or by beating the paper in a solution of sodium hydroxide, metasilicate, or phosphate which is adjusted to a *p*H of 9 to 12.6 (*3*). In the latter process, the paper is beaten until disintegrated, whereupon soap is added and the mixture beaten a short time. The soap removes the ink and filler particles from the fibers, which are then filtered away from the suspension.

A similar need for economy in power and water supply is leading to increased processing of white water. The actual economic and social (anti-pollution) benefits to be derived from an efficient treatment system are emphasized in an article by P. M. Loddengaard (*4*).

The use of soap in flocculation-flotation methods has been studied thoroughly by E. N. Poor (*5, 6*). He points out that the flocks formed by the rapid reaction between the soap and alum have the advantage of high insolubility and consequent high clearing ability. Moreover, the gel entrains many air bubbles, leading to easy flotation. The addition of certain wetting agents permits extension of this method to fibers containing talc and asbestine fillers.

A rather unusual use of soap should prove of great value to the national conservation effort by replacing metal drums formerly used for storing petroleum. The preparation of cellulosic containers which can resist oil penetration for long periods of time has always been a problem to the paper industry. A fairly recent patent (*7*) claims the solution of this problem by the use of an oil-proofing mixture in a specially prepared container. A paper-like material is coated on the inside with a mixture containing 80-95 per cent sodium silicate, 2.5-15 per cent glycerine, 1-4 per cent gum arabic, and 0.2 per cent liquid soap.

The paper chemist is probably most familiar with soap as a size constituent. In this respect, soap is considered to have a certain lubricating effect on the fibers, to improve the opacity, and to disguise the color of gelatin. The soap is sometimes used with starch, sometimes with alum, the aluminum ion precipitating an insoluble aluminum soap in the fibers. The addition of soap to sizes also improves the finish on calendering (*8*).

An interesting application of soap in size preparation is described in an American patent (*9*). In this process, a paste of corn oil soap and water is made, modified starch (15 parts to 10 of soap) is mixed in, and then 75 parts of a wax (such as melted paraffin) thoroughly incorporated. The soap prevents foaming during the operation, while the starch prevents the usually undesirable softening effect of wax. The size may be mixed with alum if used in the beaters, or diluted with 75 parts of water if used as a surface size.

Soap is often used as an emulsifier for waxes and oils. A typical emulsion is described in a wax suspension for glossing flint paper (*10*). Yellow laundry soap (7 lb.), carnauba wax (50 lb.), and water (12½ gal.) are boiled with live steam for 3-4 hours. Cool to 35 C., add 2 pounds ammonia (28 deg.) and cold water to make 50 gallons. Let stand at least 24 hours before using, as the aging improves its qualities.

A recent modification (*11*) of this method of emulsification employs a stabilizing mixture of soap, fatty acid, an organic solvent, and a saponifiable wax. The soap is formed in the preparation.

A less generally utilized property of soap is utilized in a procedure for the manufacture of a starch size which is said to be retained almost completely by the paper fibers, thus preventing the large loss of starch made by usual methods (*12*). A 50 per cent starch-water mixture is heated with 3 per cent of soap flakes at 185 Fahr. until, when viewed through crossed Nichols, the crosses have disappeared in the bulk of the granules. The soap acts as a disintegration inhibitor, so that the granules remain whole until incorporated into the paper. The mixture may be added directly to the fibers, or dried and ground and then mixed with water and added.

The chemical reactivity of soap finds useful application in waterproofing paper. A British patent (*13*) calls for dipping paper in a solution containing casein, soap, and sodium biborate, drying, and then treating with a hardening solution of formaldehyde and an organic acid. The acid, it is explained, releases the fatty acid of the soap so that it combines with the casein, resulting in waterproofing qualities. The formaldehyde enhances the waterproofing by denaturing the casein to an insoluble product. A pigment must be added for light-colored papers.

An alternate method of waterproofing is given in a more recent patent (*14*). In one example, 0.2 lb. sodium stearate soap are dissolved in 10 lb. water, 10 lb. paraffin wax (melting point 128 Fahr.) are added, and the whole heated until the wax melts. A high speed mixer is then employed to emulsify the mixture to a creamy foam. On cooling, the wax particles solidify, but remain dispersed. The advantage claimed for this method of preparation, which can be used to disperse many materials, is that the suspension is stable over long periods of time, and when diluted sufficiently, changes over into a second emulsion having good adherent properties.

A variant on waterproofing methods is a combined waterproofing and adhesive composition which is practically odorless and can be sprayed or brushed on (*15*). This composition is an aqueous emulsion containing 40-50 per cent of an adhesive thermoplastic material (such as a one-to-one mixture of asphalt and cumar resin), 0.8-1.2 per cent soap, about 1.3 per cent clay, and 6-9 per cent dispersed rubber.

Nonsticking papers, papers having low affinity for adhesives, are often made with the use of soap. One proc-

ess (*16*) uses a mixture of sodium silicate (140 g.), glycerine (15 g.), and carnauba wax emulsion (1 g.). The emulsion may be easily prepared with soap as a suspending medium.

The nonstickiness of soap is utilized in another process (*17*) which consists of first applying a wax emulsion containing soap and alkaline starch. The excess solution is squeezed off and the paper dried. A thin layer of potassium soap is then applied by running the paper through a soap solution. It is this layer which prevents sticking to adhesives, such as adhesive tape.

Soap is also finding still another helpful application in the paper industry. A British patent of general interest (*18*) describes a method of reducing the brittleness of wrapping paper, a factor of especial importance when the paper is used for machine wrapping. The paper is simply dipped in an emulsion of a non-drying vegetable oil held in suspension by soap.

Literature Cited

1) Bertrand, M. F.: Brit. Pat. 520,562 (April 26, 1940).

2) *Paper Mill,* Vol. 60, No. 15, p. 20 (April 10, 1937).

3) Darling, E. R.: U. S. Pat. 1,925,372 (Sept. 5, 1933).

4) Loddengaard, P. M.: *Paper Mill,* Vol. 63, No. 42, p. 85 (Oct., 1940).

5) Poor, E. N. and Whitenight, H. A.: *Paper Trade J.* (TAPPI Sect.) p. 101 (Feb. 26, 1942).

6) Poor, E. N.: *Paper Trade J.,* Vol. 110, No. 10, p. 37 (March, 1940).

7) Standard Oil Co. of Ohio, U. S. Pat. 2,173,517 (Sept. 19, 1939).

8) Sutermeister, *Chemistry of Pulp and Paper Making,* 3rd edition (1941).

9) French, A. H.: U. S. Pat. 2,009,488 (July 30, 1935).

10) Bennett, H.: *Chemical Formulary,* Chemical Publishing Co., N. Y., Vol. 3, p. 254.

11) National Oil Products Co.: U. S. Pat. 2,244,685 (June 10, 1941).

12) Penick & Ford, Inc.: Brit. Pat. 485,700 (May 24, 1938).

13) Ruzick, C., Sale, C. V., & Sale, G. S.: Brit. Pat. 492,608 (Sept. 22, 1938).

14) Schuh, C. H.: U. S. Pat. 2,232,977 (Feb. 25, 1941).

15) Groskopf, E. O.: U. S. Pat. 2,175,797 (Oct. 10, 1939).

16) Thompson, H. L.: U. S. Pat. 2,017,449 (Oct. 15, 1935).

17) Strovink, F.: U. S. Pat. 2,199,862 (May 7, 1940).

18) Brit. Waxed Wrappings, Ltd. & Browne, R. J.: Brit. Pat. 494,521 (Oct. 26, 1938).

Textiles From Paper

JOHN C. SHERMAN*

▸▸▸THERE IS A REMARKABLE CORRELATION between certain processes and materials of papermaking and those of textile manufacture. The similarity between blotting paper and a felt hat is obvious; but, at first glance, the relationship between spun, twisted and woven textile materials and materials the paper maker can produce with papermaking equipment is not so obvious.

In orienting a research project upon this subject, a group of American experimentalists, some few years ago, listed the following fundamentals as basic to their efforts.

1) The strength of a textile is not a function of fiber length alone. The inherent strength of a fiber is a factor, regardless of its length.

2) A plied thread or twine may be made of cellulose fibers having an average length of only a little more than one millimeter, which will match (in some respects, excel) a like thread made of cotton fibers twenty times as long, and which, in some instances, will approximate linen.

3) No textile can attain its maximum potential tensile strength unless its fibers have been oriented by combing, carding, and drafting, for instance, as in cotton.

4) In conventional papermaking processes, such unidirectional orientation of fibers is not possible nor is it commonly desirable as evidenced by the usual shake of a fourdrinier machine. The effect of the preliminary treatment given to cotton fibers to line them up, however, is capable of being realized on a slightly modified paper machine to such an extent that the modified paper machine product compares favorably with the textile equivalent.

5) In order that the modified paper machine may produce enough to pay its way, the necessary orientation of the papermaking fibers must be accomplished in that fragment of time required for the fibers to travel between the head box or vat and the wire. In this interval, the fibers must undergo some reasonable equivalent to the treatment cotton fiber receives during its processing between bale and spindle.

6) The only way yet conceived to accomplish this purpose is to operate the wire at a speed sufficiently high to favor greatest possible longitudinal orientation of the fibers deposited upon it. A paper so made would be useless, but ribbons of wet pulp with fibers so orientated can be converted easily into stout textiles, provided the fibers remain wet until the single thread is finished.

7) It is impossible by mechanical means alone to assemble fibers, whatever may be their length, into a stout thread unless they are intertwined to some extent.

8) This intertwining is effected in conventional textile processes by assembling the orientated fibers (linen, silk, or cotton) into parallel-lying dry masses and thereafter twisting up each individual mass. No such twisting up of a dry mass of cellulose papermaking fibers, the individual length of which may be as little as one millimeter, is possible. Therefore, an alternative means of accomplishment must be found. To this end, the investigators upon continuing their researches made the following observations or deductions.

9) Papermaking fibers, while still flaccid with water in which originally dispersed, are intertwined readily.

(*) Published posthumously. Mr. Sherman was well known in the industry. At the time of his passing in May of last year, he was an established engineering consultant for pulp and paper manufacturers.

Therefore, in producing a cotton—or linen-like product from such fibers, it is necessary to keep them in a drowned condition during incipient stages of conversion and in a progressively decreasing wet condition during final stages of conversion into a thread.

10) Since no conventional paper machine exists which can deposit a mass of fibers so intertwined and so oriented to the requisite extent upon a foramenous carrier, they must be oriented first as a very thin film of indefinite length and of extremely small width, and thereafter it is necessary to start twisting or intertwining them while they still rest on the carrier (the usual wire).

11) A machine might be designed, incorporating a fourdrinier type of wire operating over a cylinder with a large number of imperforate lanes around it, that would lay down a large number of narrow ribbons of wet and very lightly felted pulp, the imperforate lanes around the cylinder making the ribbon separations upon felting of the fibers.

12) The formation of the ribbons at highest possible speed must constitute an initial step, to be followed by the step of twisting at whatever lower speed may be feasible.

13) Some extraordinary means obviously are needed in high speed production to build up some mechanical strength in each ribbon, despite its wetness as emitted from the machine. This may be done by rubbing the ribbons diagonally in such a manner as they move along on the wire that they take on a rod-like formation. (Somewhat the same effect occurs in the use of belt condensers for shoddy, the rubbing, however, being transverse.)

14) These rod-like formations (termed rovings by the experimentalists) may receive an initial twist on the wire (known as false twist) which momentarily strengthens them but which interferes with final twisting. Upon reaching this point in the project, a well-known technical school was delegated to study the matter of twist as an aid in continuing the investigation.

15) Apparatus must be designed to give each ribbon, as it becomes a rod, only such twist as is necessary at the moment but which thereafter may be eliminated (as all false twists are) so as not to interfere with the real and final twist.

Advice of an outstanding microscopist was sought at this stage of the investigation. He made a series of enlarged photomicrographs of the fibers to show just what was happening. It was conceived as a result of this work that some momentary strength is given to two adjacent and parallel fibers if intertwined only to an insignificant degree. With this concept, it seemed as if a rod-like structure of wet pulp, even if it had only an almost imperceptible twist, possibly might acquire enough strength to permit handling.

Further research proved the accuracy of this hypothesis. This later work resulted in the following deductions and observations.

17) It is not the length of a fiber that determines the stoutness of a twine, but only the relation of twist to length of fiber, granting that fibers of inherent strength always are used.

The experimentalists, now ready to build a machine and to confide its operation to expert mechanics, enlisted a machinery manufacturer to build a small machine, and later a big machine, along lines determined by them.

The operation of this equipment revealed that all types of cellulose fibers are not capable of producing good textiles. Practical work, contrary to previous concept, showed that hydration was hostile to the purpose. The best twines thus far produced were formed of the least hydrated fibers.

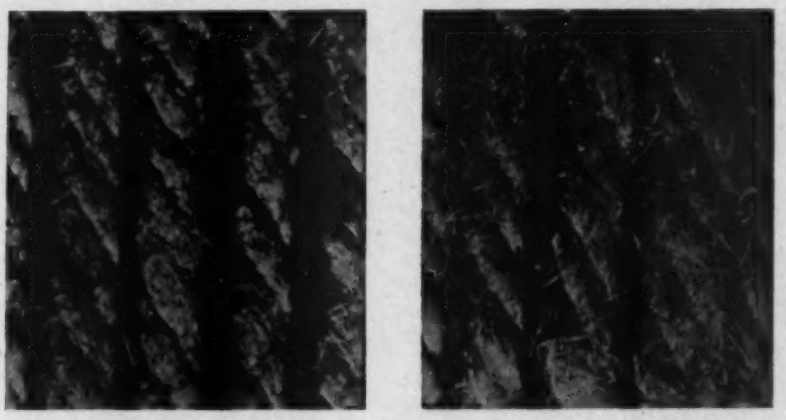
It had been supposed that there would be a cementitious bonding of adjacent fibers and that such bonding would increase as hydration increased. Final strength, however, was derived from mechanical rather than colloidal characteristics.

The next effort was to make pulp yarns and to weave them into grain bags. The twines were found to be unusually strong, but further study was required to produce them with the desired softness. (Softness and tensile strength are antagonistic qualities.)

Twines were used successfully in standard shoe machinery to sew the stout leather outer soles onto the welts of shoes. The problem of brittleness seemed, in a fair way, to be solved.

Meanwhile, as an alternative to the humbler uses for the yarns already mentioned, a bewildering variety of beautiful fabrics, some composed wholly of pulp fibers, some of admixtures of pulp strands with rayon and similar material were made for exhibit purposes.

One of the outstanding problems today is to provide substitute products. This problem is being solved in the case of both silk and rubber. There also is the need for finding substitutes for hemp, sisal, jute, and linen. In this latter case, with the exception of sisal, satisfactory substitutes for use in the production of textiles may be expected, and, even with sisal, it is possible to envision a substitute made by combining pulp yarns and certain synthetic plastics, it being possible to chemically impregnate a pulp roving without seriously impairing it for conversion into twine.



Photomicrograph of (left) pulp twine and (right) cotton twine. Twines in each case are four-ply and of the same weight. Note similarities and differences.

Underlying all of this textile research involving pulp fiber is the matter of high speed. In the investigation already discussed, it was necessary to apply powerful suction to the specially designed cylinder of the machine only at the locus of emergence from the vat in order to get the fibers to lay down on the wire in a more or less straight line. This orientation of fibers was manifest in making a pulp ribbon of only one- to three-thousandths of an inch in thickness; but, when a thicker ribbon was built up, the fibers felted themselves at random. Such a finding proved to be consistent with practice in the textile trade where it is expedient to make stout twine from a multiplicity of small individual strands.

There is an analogy in the twisting of a bundle of wooden toothpicks which previously had been made flexible by chemical treatment. If the bundle is too large, no great strength

is added to it by twisting. It is essential that a single sliver have room to entwine with its neighbors, and not with a bulky mass.

It is only the twist that adds strength. Untwist a single-ply cotton yarn and it falls apart. The same is true of pulp strands, whether wet or dry. Singles of linen, cotton, or pulp serve for weaving into a fabric; but, whatever the fiber, it cannot be formed into stout twine without first twisting the singles, for example, clockwise, and then the whole counter-clockwise.

Even so, it seems, there is a length of fiber with either pulp or cotton below which it is impossible to go. For cotton fiber, it is around one inch; for wet pulp, one twenty-fourth of an inch (one millimeter). At least, fibers shorter than one millimeter did not twine in any of the work already cited.

The old fable of a bundle of sticks being stronger than the combined strengths of its component elements is not true of this process. To arrive at great strength, a plurality of little bundles is necessary.

There is no limit in the matter of basis weight. In general, however, the thinner the individual ribbon, the greater is the relative strength contributed by it to whatever bundle of fibrous material is formed from the assembly of fibers.

A wet ribbon of pulp or the rod-like roving made from it was found to have only enough strength in the wet condition to permit handling. After twisting, however, the ribbon or roving took on a strength which no subsequent wetting impaired.

Prolonged boiling, at times, served to increase the tensile strength, wet or dry.

Being familiar with the history of twine manufacture from strips of kraft, soaked in water and run over spindles, the research workers hoped to produce a non-competitive product of higher grade.

Twines cheaply made from twisted paper were found to have poor wet strength; while strands made from wet pulp often showed a higher tensile strength when wet than when dry. Complete explanation for this contrast of qualities was never ascertained. Possibly fiber once dried cannot be wetted again to the same degree as it was in the digester. At any rate, this latter type of fiber gave best results in the twisting of pulp strands. Wetness imparted to a pre-dried sheet appears to affect mostly the interfibrous spaces, while the wetness of fiber in the gester or beater is partly intrafibrous.

Practical considerations demand the running of spindles at highest possible speed. To permit such operation, the rovings were formed as wet as paper usually goes to the first press. Then, after drying and as they reached the spindles, they were wet again by using a method familiar to any spinning mill. This wetting was accomplished just as the rovings started to twist through the back action of the twister spindles. Thus, twisting speed was brought up to where it belonged at some small decrease in final strength of the strands.

One amusing experience that occurred during the progress of the investigation involved the design and operation of the first pulp converting machine. The design included a press section, but, a young helper, during the absence of the author for some weeks and who inadvertently had the press section drawing with him, assembled the machine without pressure or squeeze roll and placed it in successful operation.

When the helper was questioned about the squeeze roll by the author upon his return to the work, his answer was "What's a squeeze roll?" Literally, the helper never had heard of one.

A squeeze roll was ordered immediately and tried out to the actual ruination of the rovings.

Negative results were obtained in a vain attempt to treat formed and dried pulp threads with latex. A pulp roving, however, previous to twisting, can be impregnated with one or another of innumerable impregnating agents. This characteristic of a roving opens up a vast field for exploration by the researcher.

▶▶▶ Pulp yarns in no way are identical with cotton or linen. Like artificial rubber, they excel in some respects and lag in others. The research revealed that:

A) The relative tensile of pulp yarns increased as their size was reduced.

B) Cotton cloth had a higher tensile than pulp cloth of the same weave from corresponding pulp yarns.

C) The stretch of a pulp yarn or cloth almost always was less than for cotton.

D) Unbleached pulp was superior to bleached.

E) Pulp fabrics, impregnated or doped after weaving, consistently had higher resistance to abrasion than the corresponding cotton, possibly due to the greater absorptivity of the pulp.

F) Pulp fabrics consistently showed poorer resistance to repeated flexing than cotton, assumedly due to the shorter fiber.

G) If final swisting of pulp fiber was overdone, the strength of the thread rapidly fell off. The scale of twists found suitable to various pulp yarns was unlike that developed later for cotton.

H) Pulp yarn, always somewhat less fuzzy than cotton, can be made more fuzzy by means known to the weaver, usually by teaseling.

I) Pulp yarn of a given count, usually slightly smaller than the equivalent cotton, would not close a fabric as effectively as cotton — that is, obliterate the holes incident to imperfect snugging-up of the warp and filling threads.

J) The ability of the pulp yarns to soak up and hold a maximum of paint or other impregnating material and their resulting resistance to frictional rubbing demonstrated the practicality of their use in fabrics for porch furniture. Their relatively little stetch factor for such an application and for other purposes was advantageous; for still other purposes, it was objectionable.

K) The subfibrils of pulp fibers now being revealed by the electron microscope may have fostered tensile strength in the strands. They likely would be vastly more important if the rovings were associated with fluidic synthetic resinous material of suitably low molecular weight and then suitably converted under appropriate thermal conditions. "Future progress in the development and use of pulp yarns may well lie along the line of chemical treatment, additive to mechanical fabrication.

The Orientals for centuries had formed paper from a specially-grown plant fiber by cutting it into strips, wetting it (sometimes on the tongue), and then twisting up a strip by hand. It was with a supply of such material from the East that the project which has been outlined was started. These fibers, though uncommonly long and stout, were found to be unavailable in tonnage and their cost was prohibitive.

About the middle of the last century, elaborate devices were developed in Scandinavian countries to twist up pulp fiber into strands. Early in this century, a substantial industry had grown up in Germany and during World War I, because of the lack of wool and cotton, it produced quite respectable suiting materials.

Our American contribution to this old art has been along lines of better quality, higher speed of production, and less cost of manufacture. It is hoped that future work in this interesting and highly potential field may be delegated to many young research workers during this crisis and that their superiors will allow them the same freedom of thought and action that was given to the group of experimentalists, the work of which has been recounted herewith.

Safety Films

LYNE S. METCALFE

▸▸▸ ACCIDENT PREVENTION always has been a major industrial problem in this country. Vast strides have been made toward its solution, and industry and Government fully recognize the fact that wartime production makes the problem even more acute, (1) because of a general speed-up, and (2) because of the influx of so much new, untrained help to operate machinery and equipment. In peacetime, lost man-hours must be held down to a minimum, but such losses in wartime cut deeply into production vital to the preservation of the Nation.

Throughout all industry, strenuous efforts are being made to attack this problem, largely through education of the operative, since industry itself has thrown every possible safeguard around plants and properties.

Because of their ability to dramatize and bring home the hazards to which carelessness exposes the worker, motion pictures have proved to be of great help in this educational job. Few will claim that motion pictures alone can do the job, will experience proves that pictures will inspire and impress the average worker with a realization of what may happen to him through carelessness.

There has been a dearth of motion pictures on this subject available to the paper mill, though there are a number of productions existent. Certainly, the average mill has its share of accident headaches in these times, and there are two motion pictures available which are broad enough in their appeal to suit the needs of mill management.

Each of these particular movies has a running time of about ten minutes, one dealing with major plant or mill hazards, common to all plants, and each example typical. The other shows the average paper mill worker how an accident in the home or on the street is to be avoided as much as one at the machine. Briefly:

"A Safe Day"

The simple story of John Jones who may be a worker in any mill. The picture shows him leaving his home for work, and taking precautions against accident from the moment he departs from his family, how he obeys traffic rules in his drive to work, how he pins up a record of 999 days without an accident at the plant, and some of the precautions he takes to achieve that result. Jones has learned to "think safety," and it is an inspiration to any worker.

"Factory Safety"

This motion picture production deals with self-protection against accident on the job, shows the importance of following safety rules, of never taking a chance, utilizing certain basic hazards as examples, and dramatizing them. The narrator explains as the motion picture action reveals, dramatically, how important it is for the worker to get the benefit of the protection which the employer provides so abundantly.

There will, of course, be continued efforts in paper mills to cut down the accident hazard through talks, meetings, demonstrations, prizes, or rewards for safety records — motion pic-

(Concluded on page 1041)

LEFT—John Jones pins up a record of 999 working days without an accident by being careful at home, on the street, and on the job. RIGHT—Mill employees are urged to lock switches for their own protection and that of others.

Matching Shades in the Beater

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E. I. du Pont de Nemours & Company, Inc.

▸▸▸ CONSIDERABLE EXPERIENCE in laboratory and mill, in addition to a knowledge of dyes used, is required of anyone assuming the responsibility of running a shade that will be a satisfactory color at the reel.

The usual practice, when new shades are in prospect, is to obtain a laboratory formula from the mill laboratory or from a dyestuff company to aid in starting the shade. The laboratory dyeing usually is made on a small quantity of stock, possibly 5 to 10 grams, the dyeing filtered and then dried on various kinds of dryers. It hardly could be expected that this procedure could compare with mill practice where any quantity of stock from half a ton to several tons is colored and run over fast machines.

Basically, a laboratory formula shows that the shade may be obtained with the dyes in question. It is offered simply as a guide to the production department.

Where close co-operation exists between the dyestuff laboratory and the customer, a laboratory formula can be expected to give a fairly satisfactory result. If the mill reports to the laboratory on the success or difficulties encountered and the changes made in a formula, the laboratory formula can be changed to more nearly approximate mill results.

In general, it may be said that more dye is required in the laboratory than in the mill to produce a given shade. The amount of variance depends on the depth of shade and the type of dye used. In light shades employing basic dyes, the difference would not be great. The greatest difference would be found in deep shades employing such acid dyes as Nigrosine and Acid Orange and pigments. When direct dyes are used, the difference would not be so great as they are retained better than acid dyes and pigments.

It is customary to *cut* the amount of dyes used in a laboratory formula. The percentage of cut depends on the depth of the shade and the type of dye used.

Whether a new shade is started from a laboratory formula, from some previous run which resembles the new shade or by guess without any lead, it is good practice to color the first beater with at least 25 per cent less dye than is expected to produce the shade. Even though a laboratory formula has been cut, it is good practice to cut the formula another 25 per cent before adding to the first beater. It is much easier to add more dye than to doctor a beater that contains too much dye.

After the dye is in the beater, the size may be added; but the addition of the alum should be delayed. Direct dyes do not show their full strength when added to stock which contains alum. In addition, most of them will granite the fiber much more if added after the alum. Therefore, for best results, particularly when direct dyes are used, all or nearly all of the dye should be in the beater before the alum is added.

In making hand samples from the beater at this point, it is better to add a little dissolved alum to the stock and water from which the hand sample is dipped or which is poured in a sheet mold. Some mills use factory-made sheet molds, approximately 8 in. x 8 in. square, in which the stock is poured for filtering. Other mills use small round molds which are dipped in the stock, the water draining through the wire bottoms of them. It makes little difference what type of mold is used, but sheets can be made somewhat faster with the round mold.

The mixture of stock and water should be approximately of the same consistency as that going on the machine (usually around ½ per cent), and a hand sample should be made as near the same thickness as the sample to be matched as possible. Likewise, the drying of the hand sample is important. Heat tends to drive dyes, particularly the acid dyes, to the surface of the sheet. If the hand sample is dried at 170 Fahr. it will be lighter in shade than if dried at 215-220 Fahr. as less of the dye will be driven to the surface. The sample should be dried as nearly as possible under the same conditions as the sheet will be when it goes over the paper machine. This operation is best accomplished by the use of a small laboratory dryer equipped with a felt and heated by electricity or steam.

After the hand sample is dried, it should be given a finish similar to the finish on the sample to be matched. This finish usually can be obtained by ironing with a hot flat iron or by running the sample through a nip in the calenders once or twice. The hand sample then is ready for comparison with the sample to be matched.

If calculations have been correct, the hand sample should be lighter than the sample to be matched. Should it possess the same tone, it is only necessary to add more dye until a hand sample shows approximately the same depth as the sample to be matched. If two or more dyes are being used, and the first hand sample shows the beater to be too red, green or off-shade in any way, the color may be built up to the right shade and depth by the addition of the proper dyes. After the beater has been built up to the desired depth and shade, the alum may be added and another hand sample taken as a check.

It has been found that the color at the reel on some paper machines will be very close to that of the hand sample from the beater. On other machines, more frequently slow running machines making heavyweight papers,

the color will come deeper at the reel than the hand sample. On still other machines, particularly fast machines making lightweight papers, the shade may come lighter at the reel than in the hand sample. Then, too, some dyes will build up color in the sheet after running a few minutes. Among dyes which have this property are Prussian blue, Nigrosine, Acid Orange and one of the Quinoline Yellows. Judgment, therefore, must be exercised in determining the depth of hand sample from the sample to be matched.

If, by chance, too much color is added to the first beater, the color must be brought back by holding some dye out of the formula for the second beater and dropping the two beaters together. The second beater should be colored as soon as possible; and, if there is sufficient time, a hand sample should be made from a mixture of stock taken from the two beaters. Then, if the shade is still not right, more dye may be added to one of the beaters and a hand sample taken again from a mixture of stocks from the two beaters for shade determination.

The number of beaters to drop will depend on the size of the individual unit and on how much paper the machine makes per hour. Whether one or two beaters are dropped, the quantity of stock in the chest should be sufficient to last the machine from 45 minutes to one hour. If two beaters are dropped, it is good practice to color the third beater with about 75 per cent of the dye used in the first two and hold it back.

When a color comes over the machine, it usually builds up for a least 5 to 10 minutes, therefore, it is necessary to wait a little while for it to settle down. If the shade is light or not of the right tone, color must be added to the chests to correct it. If agitation in the chests is good, the added color should show at the reel in 10 to 15 minutes. A single addition of color to the chests should bring the shade close to the sample.

There are several dyes that cause a change in the color of the sheet after it cools or ages. As an example: Brilliant Crocein FL is considerably yellower at the time the warm sheet reaches the reel than after it cools and ages for 5 or 10 minutes. Upon cooling and aging for this length of time, the sheet turns much bluer. Purpurine 4B has a yellowish cast when coming to the reel but turns bluer after cooling. Direct Blue AX is much redder when the sheet is warm than after it cools. When dyes of this type are in the formula, it is advisable to make sure that the sheet has cooled and aged sufficiently to show the true color before passing judgment on the match.

If the color comes too deep on the machine, correction may be made by dropping the next beater, colored with only 75 per cent as much color as the first beater or beaters, into the stock in the chests. Corrections, of course, may be made for shade by adding portions of one or more of the dyes used in the formula.

By following the above methods, it should be possible to match ordinary samples of paper without the loss of any great amount of paper at the reel. There might be exceptions with glassine, supercalendered sheets and other special finishes. In glassine, the finish deepens the shade and sometimes changes the tone to such an extent that it usually is necessary to run up a small reel and supercalender it before the color can be ascertained. In ordinary supercalendered papers, allowance must be made for a considerable increase in strength or depth, but not nearly so much as in glassine.

On board machines making colored liners, it has been found that the color of a very thin hand sample, taken from the beater, then stuck on the liner side of the web as it comes from the last vat and allowed to go over the machine and through the calenders, will be very close to that of the liner if run over the machine. Therefore, in matching a colored liner, a fairly close match may be expected at the reel if the color in the beater is built up until a hand sample run over the machine is close to the color desired.

To many persons, the term matching shades might mean only the initial runs of new shades never made in the mill before. However, every run of standard colors in many mills requires considerable matching. Due to variations in pulps, in water conditions, and in other local conditions, these shades seldom can be made with exactly the same formulas as used in previous runs.

In starting runs of colors made before, it is good practice to color the first beater with at least 10 per cent less dye than was used in the last run. Hand samples taken from the beater will show which dyes to add and the approximate amounts. In this way, it is possible to bring the sheet over the machine and have the shade at least close to standard.

Another procedure which is considered satisfactory is to make a hand sample from a beater which is known to be right in color. This sample is filed with the formula. When the next run is started, the color in the first beater is built up until a hand sample shows it to be a good match for the hand sample of the previous run.

In mills where not too many shades are run and intervals between runs are not too long, it is possible to save pint jars of stock from a beater known to be right in color. When a subsequent run of the same color is started, the first beater may be built up in color until the wet stock matches the stock in the pint jar. By this method the shade should not be far from standard when the sheet reaches the reel.

To obtain satisfactory matches it is essential that the dyes used in the run turn approximately the same as the sample under both natural and artificial light. If they turn differently, a match might be made which would look good at 10:00 A. M. under a north light but would not bear much relation to the sample at 2:00 P. M. under a southern light.

When making matches, it is advisable whenever possible to use the same light at all times. A northern exposure without colored walls or buildings outside is considered the most satisfactory. Many mills use daylight lamps 24 hours a day and thus obtain uniform light throughout the entire period. These lamps eliminate the hazards encountered in trying to match shades by daylight, on very cloudy and dark days, and in the short days of winter.

It should be remembered that the large dyestuff companies maintain laboratories which offer color matches having satisfactory light change, fastness properties, etc. They also furnish competent experienced men to go into the mills to match shades, and to solve other color problems, as well as some problems not necessarily connected with dyestuffs or coloring.

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Safety Films

(Continued from page 1039)

tures in no way act as a substitute for present methods of safety first education and supervision in the mill. Their purpose rather is to supplement routine safety education work by sugar coating the subject, as it were, in the form of motion pictures. After all, *action* and large illumination have an allure which many speakers fail to provide, and as the old saying goes: "We believe what we see, but not always what we hear or read. Pictures are proof."

Because every paper mill has its safety rules for employees, and provides the maximum in protective equipment and planning, the motion picture is of greatest value in persuading employees to follow these rules and get the protection these measures offer, rather than to endeavor a pictorial overall of the rules themselves.

That is the primary purpose of the two motion pictures just reviewed.

Transformer Overhaul

▶▶▶ FREQUENCY with which a transformer should be given a complete overhaul as a preventive maintenance measure depends upon the age and type of transformer and the conditions under which it operates. In normal operation, some transformers may and do function indefinitely without giving any trouble. But heavy loads are being carried today, and frequent checks should be made to minimize the possibility of transformer failure.

If trouble is developing in a transformer, condition of the oil may reveal it. Oil samples should be drawn and tested at least every three months from water-cooled transformers, and once every six months from self-cooled transformers of the larger sizes. If the oil tests below 20 kv., it should be dried by filtering.

Shown here are some of the steps in checking and reconditioning a transformer. Industrial plants with facilities for doing this kind of a maintenance job are the exception rather than the rule. In most cases transformers are sent into the manufacturer's local service shop for the overhaul; in some, equipment to do the job is obtained through special arrangements with the manufacturer or a utility company.

Fig. 1—The first step is to drain or pump off the oil. Usually the oil is put in a storage tank preparatory to filtering.

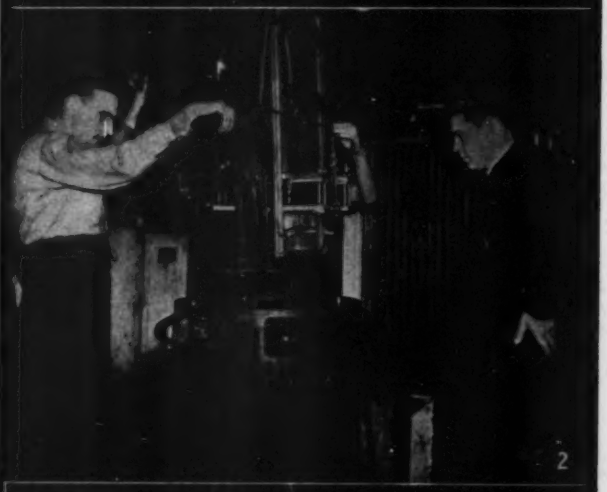


Fig. 2—Core and coil assembly is removed for a thorough inspection and cleaning. Inside of the tank is cleaned with transformer oil, removing sludge deposited at the bottom of the tank. Outside of the tank is cleaned and made ready for a repaint job.

Fig. 3—The oil is run through a filter press until it tests up to the required dielectric strength. Core and coils are replaced in the tank, and it is filled with the reconditioned oil. Insulation strength of the core and coil assembly is tested by applying voltage from a winding to other windings and ground in accordance with the manufacturer's instructions.

Fig. 4—Tank is given a good protective coating of paint, and the transformer is ready to go back into service.

PAPER SKETCHES

THE MEDIAEVAL HABIT IN ENGLAND OF WEARING LEATHER OR WOOL CLOTHING INSTEAD OF LINEN, PROBABLY DELAYED THE INTRODUCTION OF PAPERMAKING IN THAT COUNTRY.

IN 1839, TALBOT OF ENGLAND PRODUCED PHOTOS ON PAPER! THIS SAME YEAR, DAGUERROTYPE WAS INTRODUCED TO THE WORLD.

PREVIOUS TO 1890 SOME PAPERMAKERS ARE SAID TO HAVE USED POT CHEESE OR CURD IN THE COATING OF PAPER.

96 CARLOADS OF SPECIAL SAFETY PAPER, ACCORDING TO A RECENT GOVERNMENT RELEASE, WERE REQUIRED TO PRINT 150 MILLION COPIES OF WAR RATION BOOK TWO (EACH TO CONTAIN 192 STAMPS). THESE BOOKS ARE SCHEDULED FOR DISTRIBUTION EARLY THIS YEAR.

ALLIED

RELIANCE ELEC. EMPLOYEES MAKE FINE WORK RECORD

Over 150 men and women workers at The Reliance Electric & Engineering Company, Cleveland, Ohio, have not missed a single working day for the 12 months since Pearl Harbor. This attendance record represents better than 15 per cent of the total number of employees at work in the two plants of the company which were in operation at this time a year ago. Of course, new employees added since could not be included.

These 150 employees were honored by the company at special dinners on December 7. Because of round-the-clock operations, three dinners were given to include all three shifts, and company executives addressed each of the groups.

◆

HERCULES POWDER MARKS ITS 30TH ANNIVERSARY

Hercules Powder Company, Wilmington, Delaware, celebrated its thirtieth anniversary on January 1, 1943. The company has carried on a large-scale production of war materials for the Government, while its diversified chemical business has exceeded its peacetime volume to meet the demands of the war program.

Research begun by this company in 1934 at the Parlin Laboratory, and carried on since then, has saved considerable time and money in the war program.

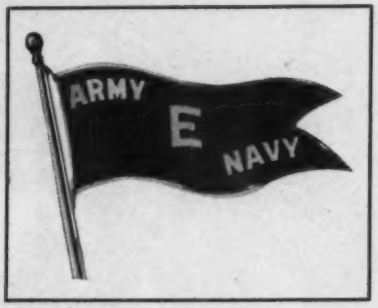
"The record of America's chemical industry in this war is one of preparedness and top-quality production," Charles A. Higgins, Hercules president, pointed out in a review of 1942.

◆

KREBS NOW KNOWN AS THE PIGMENTS DEPT.

The Krebs Pigment and Color Corporation, which has been a wholly owned subsidiary of E. I. du Pont de Nemours & Company, Wilmington, Delaware, for the past eight years, was dissolved December 31, 1942 and its functions were taken over by the Pigments Department of du Pont.

This change of name involved no change in the personnel of the sales, manufacturing, or research divisions, nor any change in the management or policies. The Pigments Department of E. I. du Pont de Nemours & Company (which is the new name of the company) will continue to supply white zinc sulphide and titanium pigments and chemical dry colors to manufacturers of paint, linoleum, ink, leather, coated fabrics, paper, soap, rubber, rayon, shadecloth, ceramics, and other products. Research activities will continue, as heretofore, to be directed toward the development of new and improved white pigments and dry colors.



ARMY-NAVY "E" AWARDS

Buffalo Forge Company, Buffalo, New York—The Army-Navy Production Award was very appropriately awarded to this company on the first anniversary of Pearl Harbor. The presentation was made by Rear Admiral Wat T. Cluverius, U. S. N. (retired), and was accepted by Henry W. Wendt, chairman, and Edgar F. Wendt, president of Buffalo Forge. One of the highlights of the ceremony was the tribute paid by Mr. Wendt to the company's veteran workers. Col. John M. McDowell presented employee "E" pins, which were accepted on behalf of the more than 1,500 employees by John Giertz, Edgar L. Uhl, and Don R. Marsh.

Chromium Corporation of America, Chicago—The Army-Navy "E" Award was conferred upon the Chicago plant of this company in an impressive ceremony held on December 15. Commander A. A. Burke, U. S. N., presented the award, which was accepted by L. J. Jensen, district manager of Chromium Corporation. Dr. F. H. Hirschland, president, congratulated the personnel of the plant upon their "untiring efforts and effective co-operation in the war effort." Lieut. Jerome M. Jontry, U. S. N., was master of ceremonies, and Major Lauris Eek, U. S. Army Air Corps, presented the workers' emblems, which were acccepted by an employee committee.

Dow Chemical Company, Midland, Michigan—The Double "E" Award—two Army-Navy "E" Awards for production excellence were presented to this company recently. Present at the ceremonies were Major General William N. Porter, Chief of Chemical Warfare Service; James W. Driver, Dow personnel director; Captain C. D. Swain, Naval Inspector of Ordnance; and Dr. Willard H. Dow, president. General Porter complimented Dow employees for "in some instances doubling the designated capacities of your plants."

Allied

Sandy Hill Iron and Brass Works, Inc., Hudson Falls, New York—The Navy "E" with a star was presented by Lieut. Robert Anderson at the annual banquet of this company January 2, at the Queensbury Hotel, Glens Falls, New York. The company was awarded the Navy "E" May 8, 1942, (cf. THE PAPER INDUSTRY AND PAPER WORLD, May, 1942, p. 162), and this award was made in recognition of continued excellence in production of material for the Navy department. Lieut. J. Walter Juckett, secretary of the company, was master of ceremonies and Frank A. Juckett, president, gave a brief address of welcome in which he expressed his appreciation to the employees for their achievement.

◆

SOCONY-VAC. USING PAPER CONTAINER

For the past nine months, an all paper container has been used by the Socony-Vacuum Oil Company, Inc., for marketing lubricating oil in its Southeastern Division. The Socony-Vacuum Company has just concluded arrangements with the General Container Corporation, New York City, whereby the latter corporation will grant licenses for the manufacture of this container which is the product of the combined research of the Socony-Vacuum Oil Company and J. M. K. Harrison.

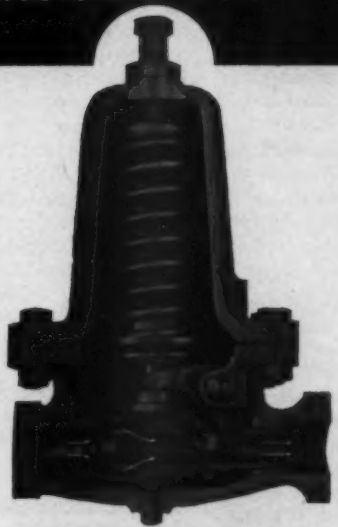
The Socony-Vacuum Company manufactured and used 500,000 of these new containers for its own use in the past year and is planning to produce them in 1943 at the rate of 12,000,000 per year. In appearance and service the new paper container resembles the conventional quart tin can which has ceased to be available (except on priorities) for the duration. It is also adaptable for other liquids and dry products.

CASH STANDARD *Streamlined* REDUCING VALVES

TYPE 1000 PRESSURE

THEY'LL SEE YOU THROUGH WITH *Non-Stop Production . . .*

● Smooth, speedy, non-stop production is a vital thing today. It's a great advantage to have the dependability of operation—the smooth, even flow of steam, air, or oil—the better pressure control and greater capacity obtainable with the "1000" Valve. The Streamlined flow pattern you see at the right pictures for you the kind of valve action you get that is an important factor in keeping things going on your production front. Years after they have been installed, "1000" Valves perform so that you continue to realize all of the twelve benefits listed below. The "1000" is known as the "NO TROUBLE" Valve.



HERE'S THE "1000" FLOW PATTERN
The Streamlined form of the inner valve eliminates turbulence. It produces the flow pattern shown above which makes for maximum capacity when it is needed most and permits accurate pressure control under toughest working conditions.

POINTS THAT COUNT BIG IN YOUR FAVOR

You get all Twelve . . .

1. Maximum Capacity when needed most
2. Accurate Pressure Control under toughest working conditions
3. Trouble-free Service
4. Smooth Operation
5. Tight Closure
6. Accurate Regulation
7. Speedier Production Results
8. Elimination of failures
9. Constant Delivery Pressure
10. Cost Saving Operation
11. No Spoilage
12. Practically zero in maintenance costs

You can find out full details on all of the Type 1000 benefits by reading Bulletin "1000"—send for it!

New CASH STANDARD *Remote* HYDRAULIC *Control*

●

Transmits oscillating motion without mechanical linkage

TYPE 550 SENDER

●Primarily used by aircraft manufacturers and aeronautical laboratories on engine test cells for controlling throttle position and mixture—this Type 550 Remote Hydraulic Control may fit your needs too. It is good for use where you desire to control apparatus remotely—without mechanical linkage. To operate, depress button in control lever with thumb. This releases the automatic brake. Move control lever to any desired position: release button, and control is automatically locked in that position, where it will remain indefinitely. The unit — A Type 550 Sender (above) and Type 550 Receiver (below), has positive hydraulic power in both directions — no springs, no cups on pistons. It transmits the total force applied to the control lever. There is no lost motion in either direction. The lever of the Receiver moves 90 degrees. It can be indexed to any position. For easy mounting, the bracket of the Receiver can be indexed to four positions. The Receiver can be installed above or below the Sender.

TYPE 550 RECEIVER

Write for Data

A. W. CASH COMPANY
DECATUR, ILLINOIS

CASH STANDARD
CONTROLS.. VALVES

ASSOCIATIONS

WARTIME PROBLEMS WILL BE DISCUSSED AT TAPPI MEETING

The Technical Association of the Pulp and Paper Industry will hold its annual four-day convention at the Commodore Hotel, New York City, February 15-18, 1943. Wartime technical problems, particularly featuring the progress being made toward relieving the critical materials shortages by the development of new packaging materials and containers, will be discussed by managers, operating men, and technologists in the paper and containers industries.

These developments will be dramatized by an exhibit of hundreds of new products made from paper and paperboard, and all companies that have developed new packages during the past year are urged to display them. There will be no charge for the use of space, and companies willing to display the packages and containers developed for their own use or for others should write to R. G. Macdonald, secretary, Technical Association of the Pulp and Paper Industry, 122 East 42nd Street, New York City, for details.

◆

▸▸▸ THE ASSOCIATION OF Consulting Chemists and Chemical Engineers, Inc., met on December 7 at the Electrical Testing Laboratories, Inc., New York City, for a "Conference on War Service" by independent consulting chemists and chemical engineers and privately owned laboratories. Present also were representatives of the U. S. Army—Chemical Warfare Service and Ordnance Department, Services of Supplies, of the U. S. Navy; Bureau of Ships, Bureau of Supplies and Accounts and Navy Purchasing Office, and representatives of the War Production Board.

◆

AMER. STANDARDS ASS'N SETS RECORD

A new production record was set in 1942 by the American Standards Association, R. E. Zimmerman, president, reported at the annual meeting of the Association which was held at the Hotel Astor, New York City, December 11. Work in the past 12 months, all of which has tied in closely with the country's war effort, resulted in 73 new standards and 49 revisions of existing standards—a completed standard for practically every third day of the year. In addition, the Association completed 10 American War Standards requested specifically by WPB, OPA, or some other Governmental agency.

Election of officers was held. Mr. Zimmerman, vice president of U. S. Steel Corporation, was re-elected to serve a third term as president; and George S. Case, chairman of the board, Lamson and Sessions Company, was elected vice president.

◆

NEW ENG. TAPPI TO HAVE BUT 3 MEETINGS 1943

The New England Section of TAPPI held a meeting at the Hotel Roger Smith, Holyoke, Massachusetts, December 11, at which two government spokesmen, Lieut. Col. Roy C. Charron, regional field officer of the selective service system and Capt. R. A. B. Heap, chief of the labor section supply board of the Springfield ordnance district, spoke on "The Government Manpower Policy and How New England Paper Mills Will Be Affected."

It was stated that New England paper mills not engaged in the manufacture of paper essential to the war effort may have to limit manufacture of their products soon, and those fortunate enough to manufacture essential papers, will find it necessary to do so with women employees, boys under 18, and men over 45.

A new policy has been put into effect by the association pertaining to regular meetings. There will be only three meetings for the year, the meeting referred to above, one in March, and another in May.

◆

WIDE RANGE OF EXHIBITS SEEN AT POWER SHOW

That industry is ready for further expansion as the exigencies of war may dictate from now on was clearly shown at the 15th National Exposition of Power and Mechanical Engineering held in Madison Square Garden, New York City, November 30 to December 4.

Registration for the show this year ran well over 34,000, which included a large number of men in uniform, indicating the close ties existing between power consuming industry and the actual conduct of the War. Exhibits at the Show included raw and fabricated materials, processing equipment and supplies, a long line of specialties for the power house, and a considerable display of machine tools and other manufacturing equipment. Many exhibitors, instead of displaying new products, showed samples of war products on which their plants are now engaged, and in the case of some of the tool manufacturers, showed machines in operation on actual government contracts. Great emphasis was laid to plant economy, especially through apparatus designed to improve combustion or reduce heat waste, and to conservation of existing power and manufacturing equipment through improved methods of maintenance, repairs, and even salvage of obsolete units which could be modernized.

◆

▸▸▸ THE MANY FRIENDS of Robert L. Eminger, secretary-treasurer of the American Pulp and Paper Mill Superintendents Association, will be pleased to learn that he is at home again after spending a few weeks in a hospital. "Bob" is doing nicely now, and it is hoped he will soon be as well as ever and going about his activities the same as usual.

◆

GAS RATIONED— BUT EMPIRE STATE TAPPI HAS DINNER

Northern New York area members of the Empire State Section of the Technical Association of the Pulp and Paper Industry held a dinner meeting at the Hotel Woodruff, Watertown, New York, December 3; however, because of gasoline and tire rationing, coupled with highway conditions due to a storm, attendance was cut from the usual 50 or 60 to 25.

Frederick Goodwill, technical director of the St. Regis Paper Company at Deferiet, presided, and the papers were read by Dr. A. Raymond Powers, head of the electrical engineering department of Clarkson College of Engineering at Potsdam and director of engineering, science, and management of war-training courses sponsored by the Federal Government, and by C. S. Maxwell of the research department of the American Cyanamid Company, Niagara Falls. The dinner was arranged by Ronald Benson, technical superintendent of National Paper Products Company, Carthage, and chairman of this TAPPI area.

Maintenance Message to Mills Operating Miami Pumps

To help you operate your Miami pumps at top efficiency.... to avoid costly repairs and even breakdowns.... we write this message.

Three points will be emphasized. First, your Miami pump impeller will wear and slip after hard service as will any well built pump. But unlike most, Miamis have a special feature that perhaps you are unacquainted with....adjustable impellers, that enable you temporarily, to renew their efficiency while waiting for a replacement to arrive.

Today, when side plates wear, it is next to impossible to replace them. But with Miami's special bearing construction, you can adjust the clearance between these plates and the impeller, thereby quickly restoring pump efficiency.

Second, packing boxes should be kept flooded with fresh water at all times. The Miami design is particularly trouble-free, but even so, carelessness with the water seal can lead to trouble. To make this flushing easy, we have provided a special water connection which millwrights find unusually convenient and effective.

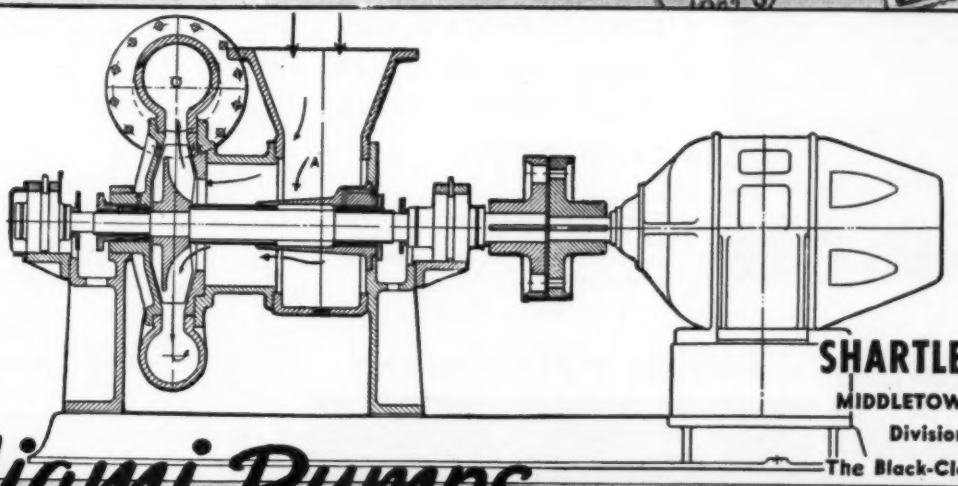
Third, we call your attention to correct lubrication of bearings, easy to do with Miami pumps. Bearings, like tires, are practically unobtainable and ceaseless care must be taken to keep them in good operating condition. Be sure an expert does the job and does it right... does not jam the bearings full of heavy grease or permit them to run dry.

Miami pumps are specialized paper mill pumps. Utilize their many design features and they will give you extra months of high efficiency performance.

SHARTLE BROTHERS MACHINE CO.
Division of the Black-Clawson Company
MIDDLETOWN, OHIO

SHARTLE BROTHERS MACHINE CO.
DIVISION OF THE BLACK-CLAWSON CO.
MIDDLETOWN, OHIO

MIDDLETOWN OHIO NOV 27 1130 PM



SHARTLE BROS.
MIDDLETOWN, OHIO
Division of
The Black-Clawson Co.

Miami Pumps

ASS'N COMMITTEE PLANS TO IMPROVE STREAM PROBLEM

A comprehensive and constructive plan for an effort to reach a permanent solution of the stream improvement problem has been promulgated by the American Paper and Pulp Association. The plan, as drawn up by the Stream Improvement Committee of the American Paper and Pulp Association, has been approved in principle by the Executive Committee of the Newsprint Manufacturers Association of the United States. The National Paperboard Association has authorized the submission of the plan to its mills for their individual approval or disapproval.

In view of the fact that individual mills have spent millions of dollars in efforts to solve their individual problems, the industry now feels that it is an appropriate time to seek a practical solution of the broad problem by a complete investigational program, on which can be based a realistic program for co-operation between industrial, governmental, and other agencies for the achievement of a practical goal. An organization to carry the program into effect will be composed of representatives of various groups, in proportion to the amount of funds subscribed to carry on the work.

NAYLOR

THE PIPE TO REMEMBER WHEN VICTORY IS WON

- SAVES STEEL
- LIGHT IN WEIGHT
- EASIER TO INSTALL
- LEAK-TIGHT, SAFER
- ABSORBS SHOCK LOADS
- FABRICATED TO YOUR EXACT SPECIFICATIONS
- SAVES MONEY

Advantages like these have made Naylor the outstanding paper mill pipe. Sizes from 4" to 30" in diameter with all types of fittings and connections.

Write for Catalog

NAYLOR PIPE COMPANY

1236 East 92nd Street, Chicago, Illinois

DR. WILSON GIVEN PERKIN MEDAL

The Perkin Medal for 1943 was presented to Dr. Robert E. Wilson, president of Pan American Petroleum and Transport Company, on January 8, at the Hotel Commodore, New York City, at a joint meeting of the American Section of the Society of Chemical Industry, the American Institute of Chemical Engineers, the American Chemical Society, the Electrochemical Society, and the Societe de Chimie Industrielle.

The medal is awarded annually by the American Section of the Society of Chemical Industry for outstanding work in applied chemistry.

CONVENTIONS AND COMING EVENTS

February 15-18—Annual meeting of the Technical Association of the Pulp and Paper Industry at the Commodore Hotel, New York City.

February 15-19—"Paper Week" annual meetings of American Paper and Pulp Association and affiliated bodies at the Waldorf-Astoria Hotel, New York City.

May 16-19—National Paper Box Manufacturers Association Silver Anniversary Convention, The Drake Hotel, Chicago.

June 15-17—National Convention of the American Pulp and Paper Mill Superintendents Association, Commodore Hotel, New York City.

STATED MEETINGS

Technical Association of the Pulp and Paper Industry.

Delaware Valley Section—First Friday of each month—Engineers' Club, Philadelphia.

Kalamazoo Valley Section—First Thursday of each month—Park American Hotel, Kalamazoo, Mich.

Lake States Section—Second Tuesday of each month—Conway Hotel, Appleton, Wis.

New England Section—Regular meetings of this group have been discontinued. The next meeting will be held in March.

The American Pulp and Paper Mill Superintendents Association, Inc.

Michigan Division—Third Thursday of each month—Park American Hotel, Kalamazoo, Mich.

Appleton Felts

MAKE GOOD PAPER

You'll get service, too, from Appleton Felts, that are designed and manufactured with technical foresight as quality felts.

Today's standard for paper mill felts, Appleton Felts meet the high speed production requirements of mills. Since 1890 Appleton Felts have been keeping pace with paper making—that's why.

BUY WAR BONDS

Appleton Woolen Mills

APPLETON • WISCONSIN

SAFETY

WARTIME AWARD OF NSC GIVEN TO E. I. du PONT CO.

An unusual safety presentation was made over the NBC network on the evening of January 4, when Colonel John Stilwell, president of the National Safety Council made a special award to the E. I. du Pont de Nemours & Company.

This award, known as the National Safety Council's special wartime award for distinguished service to safety, was presented by Colonel Stilwell to W. S. Carpenter, Jr., president of du Pont, preceding the company's radio broadcast, Cavalcade of America.

The record which won this award is that 38 plants of the du Pont Company have had no reportable accidents *in the last 18 months*. Also, one du Pont plant had previously set a world's record of more than 11,000,000 manhours without a reportable accident. Such a record is proof of the company's effort to "Save Manpower for Warpower."

◆

▶▶▶ A CERTIFICATE OF MERIT for attaining a better-than-average safety record during the past year has been awarded the employees of Hammermill Paper Company, Erie, Pennsylvania, by the Pennsylvania Department of Labor and Commerce. Workers in the beater department at Hammermill received the Certificate of Honor for having gone through the entire year without a single lost-time accident. Merit certificates were awarded to the maintenance, finishing, power, and sulphite departments.

◆

SAFETY RESEARCH DIRECTOR HEADS NEW OCD FIRE UNIT

L. W. Hutchins, president of Sheldon, Morse, Hutchins & Easton, Inc., and director of the Safety Research Institute, Inc., of New York City, has been appointed chief of the newly organized Education Unit in the Fire Defense Section of the U. S. Office of Civilian Defense.

The function of this new unit will be to direct public education on fire defense. It will also serve as a coordinating agency in matters of fire defense between the various OCD divisions and between the OCD and other government agencies.

As director of Safety Research Institute, which is active in fire protection education, Mr. Hutchins has been closely associated with the fire safety field for a number of years. He is a member of the National Fire Protection Association, the Agricultural Committee of the National Fire Waste Council, the National Safety Council, and a number of similar organizations.

◆

GRASS-ROOTS DRIVE AGAINST ACCIDENTS

The National Safety Council is making progress tracking down the spectre of manpower losses through accidental death and injury hanging over war production lines. Latest and biggest counter-move in what is shaping up as a national safety movement is a grass-roots drive on accidents planned for 14 major war production centers.

For the past several months the Council has been feeling out the national accident situation. A network of liaison with government agencies, with private industry and over a hundred private organizations has been set up. And now, with the decks cleared for action, and armed by voluntary contributions through the War Production Fund to Conserve Manpower, the National Safety Council is in a position to go to town in a big way.

William A. Irvin, national chairman of the fund and former steel executive who has emerged as the Nation's spokesman for safety in America, will visit areas hampered by accidents in turning out the tools of war with maximum efficiency. He will be accompanied by Colonel John Stilwell, president of the National Safety Council, and other representatives of that organization.

◆

CLAYTON BRAATZ IS NOW MAJOR BRAATZ

The many friends of Clayton O. Braatz, formerly safety director for the Marathon Paper Mills Company, Rothschild, Wisconsin, and more recently secretary-treasurer of the Wisconsin Pulp and Paper Manufacturers Association, will be interested to learn that on December 7 he was commissioned as Major, AUS, and assigned to the Civilian Personnel Branch, Headquarters Services of Supply.

Major Braatz served as general chairman of the Paper and Pulp Section of the National Safety Council for the year 1941-1942.

The Paper Industry Safety Scores

July 1, 1942 to June 30, 1943

Out of 197 mills reporting for November, 18 have perfect record

PERFECT SCORES
Division I—Pulp and Paper Mills

PARTICIPANT	MILL	LOCATION
GROUP A		
GROUP B		
Hoberg Paper Mills, Inc.	Div. "A"	Green Bay, Wis.
The Flintkote Co.	Meridian	Mississippi
GROUP C		
Price Brothers & Co., Ltd.	Jonquiere	Quebec, Canada
*Central Fibre Products Co.	Quincy	Illinois
American Writing Paper Corp.	Riverside #2	Holyoke, Mass.
GROUP D		
U. S. Gypsum Co.	Board Mill	Lisbon Falls, Me.
Marathon Paper Mills Co.	Ashland	Wisconsin
American Writing Paper Corp.	Crocker Div.	Holyoke, Mass.
*Spaulding Fibre Co., Inc.	Milton	New Hampshire
American Writing Paper Corp.	Mt. Tom Div.	Holyoke, Mass.
*Central Fibre Products Co.	Denver	Colorado
Union Bag & Paper Corp.	Allen Paper Mill	Hudson Falls, N. Y.
International Paper Co.	Riley #23	Riley, Me.
Division II—Paper and Board Re-Manufacturing		
Marathon Paper Mills Co.	Wausau	Wisconsin
Fort Orange Paper Co.	Paper Box Plant	Castleton on Hudson, N. Y.
South West Box Co.	Sand Springs	Oklahoma
Thilmany Pulp & Paper Co.	Bag Mill	Kaukauna, Wis.
Bay West Paper Co.	Green Bay	Wisconsin

*November report missing—covers four months only.

10 Advantages of DE LAVAL Velocity-stage TURBINES for Driving Auxiliaries

Driving boiler-feed pump.

Driving single-stage pump.

Driving boiler-feed pump.

Driving boiler-feed pump.

1 Most reliable; independent of electrical transmission line, generator and switchboard disturbances.

2 Create no fire hazard; cannot short circuit; sparkless.

3 Immune to hot or moist atmosphere.

4 Low maintenance and attendance costs.

5 Take the place of reducing valves.

6 Produce practically costless by-product power from heating or process steam.

7 Maintain heat balance with varying power and heat loads, avoiding waste of steam and unnecessary charges for electrical current.

8 Exhaust free of oil or grease.

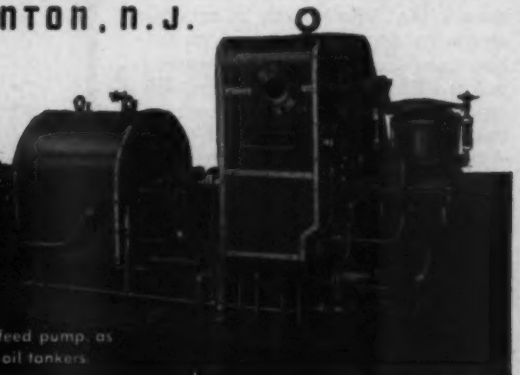
9 Inexpensive as stand-by drives, always available while there is steam pressure.

10 Speed can be adjusted over a wide range, while still maintaining good efficiency.

Our engineers will supply information and advice upon receipt of data as to steam and power conditions in your plant. *ASK FOR PUBLICATION T-3528.*

DE LAVAL *Steam Turbine Co.*

TRENTON, N. J.


Driving boiler feed pump, as installed on oil tankers.

NAMES *in the* NEWS

Personals

RECENT PERSONNEL CHANGES AT ABITIBI

Several changes have been made recently in the organization of Abitibi Power and Paper Company as follows: *George S. Balko* has been engaged as general superintendent of Manitoba Paper Company at Pine Falls, Manitoba; *J. T. Carey,* formerly general superintendent at Pine Falls, was transferred to the Thunder Bay mill at Port Arthur as general superintendent; *J. Tremblay,* day boss machine tender at Iroquois Falls, Ontario, was transferred to Pine Falls as paper mill superintendent; *E. W. McBride,* of the Toronto office, has been appointed mill manager of the Ste. Anne Paper Company, Beaupre, Quebec, in place of the late D. E. Dupuis. *Frank Lavallee* has been promoted to the position of paper mill superintendent of the Ste. Anne mill, and *R. W. Sterns,* Iroquois Falls, has been transferred to Beaupre as resident engineer.

◆

ONE MAN'S IDEA HAS BECOME THE BAY STATE CLUB

A well known personality bearing a name identified with papermaking for several generations has made a very special contribution to the war effort. William Bond Wheelwright, now connected with the advertising business, saw one of his ideas bloom into reality when on November 22 he assisted in the dedication of the Bay State Club, Boston's newest Service Men's Recreational Center.

Once the idea of the Bay State Club came to Mr. Wheelwright, he not only sponsored the planning and organization necessary to such a development, but he gave his own time and personal effort to the strenuous task of solicitation of finances, materials, and labor. All of this was done in a quiet, businesslike manner without any publicity campaign such as that which has given support to many such projects. However, on the day of the dedication, the real story of Mr. Wheelwright's achievement was written up by Bill Cunningham, columnist, in the *Boston Sunday Herald.*

Ranking high in the list of donors of materials for the Club were the following paper companies:

Bird & Son, Inc. (shingles, Bric Siding, Chromalite floor covering)

Masonite Co. (Masonite for dadoes)

Haverhill Boxboard Div., Robert Gair Co. (Wall board for walls and ceiling)

Tileston & Hollingsworth Co. (Tiho bond for 100,000 letterheads)

Carter, Rice & Co. (Strathmore Fiesta red, deckle-edge paper for programs)

And so the Bay State Club, with all facilities of a gentleman's club, now welcomes as its guests all men in uniform. Instead of a discarded idea, one man's vision and persistent effort have been largely instrumental in erecting this service men's haven. There is unlimited opportunity for such patriotic effort.

◆

WENT. BROWN NOW PRODUCTION MGR. BROWN CO.

Wentworth Brown has been appointed manager of production of Brown Company, Berlin, New Hampshire, succeeding John D. McCrystle, who has resigned.

Mr. Brown is the son of O. B. Brown, a director of this company, and is a grandson of the founder,

Wentworth Brown

W. W. Brown. He joined the company in 1929, after graduating from Andover Academy and Williams College, and was employed in the Burgess mill and the research department. In 1931, he went to La Tuque, Canada, to take charge of production at the Brown Corporation mills. Mr. Brown serves this wholly owned Canadian subsidiary as manager of production and vice president, which positions he will continue to hold in addition to his new duties. He is also vice president of St. Maurice Power Corporation in which Brown Corporation holds a half interest. He is active in the technical section of the Canadian Pulp and Paper Association and the Technical Association of the Pulp and Paper Industry.

◆

PHILIP D. REED RESIGNS AS BOARD CHAIRMAN OF G-E

Philip D. Reed, chairman of the board of the General Electric Company, Schenectady, New York, resigned all of his company posts January 1, in order to continue his work in London as deputy chief of the Harriman Mission.

"In view of the indefinite duration of this government work overseas and in view also of the return to active service of Owen D. Young as acting chairman of General Electric, I felt that I should relinquish my posts as director, chairman of the board, and chairman of the executive committee of the company. I have simultaneously resigned directorships in subsidiary companies," Mr. Reed stated.

Mr. Reed began his work in London last July, 1942, having been granted a leave of absence to the end of the year by his company. Both Ambassador John G. Winant and W. Averill Harriman, head of the mission in London, requested him to continue.

◆

CAN. ASS'N OFFICER NAMED PULP ADMN.

George S. Pincott, assistant secretary of the Canadian Pulp and Paper Association, has been appointed administrator of wood pulp for the Wartime Prices and Trade Board. He succeeds C. M. Matheson, appointed a year ago, who asked to be relieved of the duties because of pressure of other responsibilities. Mr. Matheson, however, will continue to serve the Board as a member of the advisory

The Old Pledge . . .

RENEWED!

The 85th year of continuous operation greets the fourth generation of men and women who carry on the tradition of Hamilton Felts. The fathers and grandfathers of many of them labored here, determined to make the best possible felts for the varied requirements of the paper industry. To the challenge of global war they present a united front. As in every war in which our country has been involved, Hamilton Felts will do their duty. » » And as every soldier, sailor, marine and flyer in the fighting forces of the Nation is specially equipped for the kind of duty before him, so every Hamilton Felt is constructed to perform its special function on the paper machine. Tell us what kind of paper you desire to produce and we will provide the Hamilton Felt that will do your work better, faster and at lower cost.

From the thinnest tissue to the heaviest board, there is a Hamilton Felt that will do your work better, faster and at lower cost.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

committee of the wood pulp administration.

After serving in the Army during World War I, Mr. Pincott joined the Abitibi Power & Paper Co., Toronto, in 1919 as paper inspector. Later he was associated with the Anglo-Canadian Pulp and Paper Mills, Anglo-Newfoundland Development Company, Ltd., and Bathurst Power & Paper Company.

◆

▶▶▶ In 1935, *Bruce Crocker* left his connection with the Whitaker Paper Company, Chicago, to become Chicago representative for Crocker-Burbank Company, Fitchburg, Massachusetts. Last month, Mr. Crocker returned to Whitaker Paper Company as vice president and manager. *C. L. Buchanan*, who has served in the capacity of manager since the sudden passing of Jack Hillyer will continue as a member of the sales staff.

◆

STRATHMORE MAKES OFFICIAL CHANGES

Horace A. Moses was elected to the newly created office of chairman of the board of directors of the Strathmore Paper Company, Springfield, Massachusetts, at the annual meeting of stockholders. John D. Zink, who had been first vice president, was elected to succeed Mr. Moses.

The office which Mr. Zink had held as first vice president is now eliminated, and the corporation will have a single vice president, Cassius M. Bryan, who has previously filled that office. Other officers re-elected were: treasurer, George E. Williamson; assistant treasurer, Arthur E. Shattuck; assistant treasurer, F. M. Bridgham; and clerk, B. E. Stafford. The directorate consists of the officers and Charles A. Russell of Haddam, Connecticut; Horace J. Rice of Wilbraham; and Miss Madelyn Moses of Woodbury.

◆

▶▶▶ Since the beginning of the year, *Allen Abrams*, vice president in charge of research and development, Marathon Paper Mills Company, Rothschild, Wisconsin, has been in Washington, D. C., as deputy director of the research and development division of the Office of Strategic Services.

◆

▶▶▶ *Walter L. Bubie*, of Montreal, in charge of the forestry division of Consolidated Paper Corporation, was elected president of the Association of Forestry Engineers of the Province of Quebec when the 22nd annual convention of the Association was held at Quebec on December 17. Robert Bellefeuille, of Quebec, is the retiring president.

◆

HOWARD GRAVES NOW GEN. MGR. D. W. HAERING CO.

D. W. Haering & Company, Chicago, announces the appointment of Howard B. Graves to the position of general manager of the company. Mr. Graves joined the company in 1934 as senior technologist, and was formerly the St. Louis district manager. His wide background in the mechanical

Howard Graves

engineering field thoroughly qualifies him for the position of general manager.

The company's research staff has recently announced the successful application of chrom glucosates for vapor phase injection in conjunction with ammonia for complete inhibition of corrosion in refinery equipment. The field and research engineers of the company also have developed a method of controlling corrosion in salt water and brines, making possible the use of iron and steel pipes to replace admiralty and high alloy tubing in industry. Research is also being directed to the control of high capacity corrosion and additional experimental work is being carried out on cooling water and condensate corrosion control.

◆

▶▶▶ Director of the Oxford Paper Company, Rumford, Maine, and the Maine Seaboard Paper Company, Bucksport, Maine, *Robert Braun* has been elected president of the five Maine textile mills of New England Industries, Inc., including those of the Androscoggin Mills and the Bates and Hill Manufacturing Companies, all of Lewiston; the York Manufacturing Company, Saco; and the Edwards Manufacturing Company, Augusta. He succeeds the late Walter S. Wyman. Mr. Braun was also active in the reorganization of the Brown Company, Berlin, New Hampshire.

◆

▶▶▶ *P. W. Foster, Jr.*, was elected vice president of the Foster Wheeler Corporation, New York City, on November 23. Mr. Foster has been with the corporation since its organization in 1927, when it was formed through consolidation of Power Specialty Company and Wheeler Condenser and Engineering Company. Prior to this, he was associated with one of the antecedent companies, Power Specialty Company in the Steam Generation Division.

◆

NEVER ABSENT OR LATE IN 59 YEARS

Fifty-nine years of service with one firm—Smith Paper, Inc., Lee, Massachusetts—and never late or absent from his job in all those years is the record left by Patrick L. O'Connell when he retired recently. On the day of his retirement, he received a personal letter from the president of the company praising him for his outstanding record, and he was also honored by his friends and co-workers.

Mr. O'Connell began working at the Columbia mill of the company in 1883, at the age of 15. Eight years later he was put in charge of the rag room, where he continued as foreman for 35 years.

◆

▶▶▶ General sales manager and manager of the Vancouver (B. C.) office of Sidney Roofing and Paper Company, *Patrick W. Field* has been appointed to the board of directors of the company. He has been with the company for the past 14 years and is well known in provincial construction circles.

◆

▶▶▶ Now working in the office of the Paper Administrator of Canada on allocation of power are *E. B. Wardle* of Consolidated Paper Corporation, Ltd., Montreal, and *G. F. Layne* of Price Brothers & Company, Ltd., Quebec.

◆

▶▶▶ The appointment of *Walter S. Hulbig* as general sales manager of the E. B. Eddy Company, Ltd., of Hull, Quebec, has recently been announced.

POWELL *has them all*

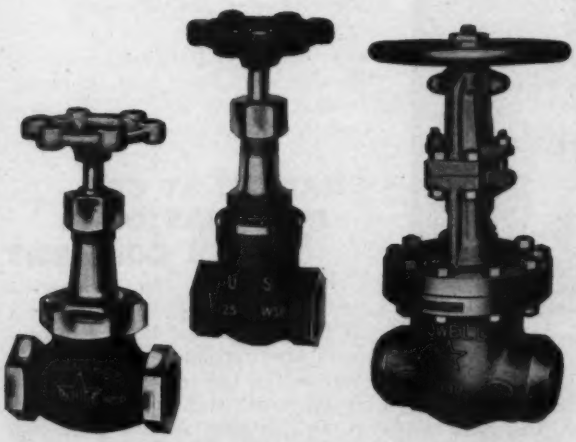
The history of the Powell Line is written in the amazing evolution of American Industry, because for nearly a century Powell has been meeting and satisfying every demand imposed by each new process or development in the industrial world.

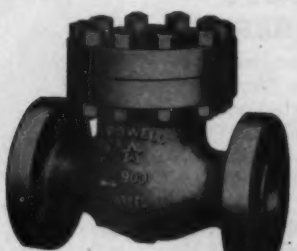
Big valves, little valves . . . valves for high pressures, low pressures . . . for varying temperatures . . . for corrosion resistance. Globes, gates, checks, reliefs, non-returns, Ys, angles . . . in iron, steel, bronze, pure metals and special alloys—***Powell has them all.***

Shown here are a few examples of the many Powell Valves evolved by our Research Engineering Staff to meet some particular requirement. Having completely fulfilled it, they have taken their place in the Powell line.

Today, for every known demand, Powell has the answer. And, as new problems arise in the future, Powell Engineering will be ready and able to solve them. In either case Powell Quality costs no more in the beginning and saves in the long run.

The Wm. Powell Co.
Dependable Valves since 1846
Cincinnati, Ohio





POWELL VALVES

NOPCO'S JAS. FRITZ NOW WITH CHEMICAL WARFARE SERVICE

Chief chemist of the paper laboratory of National Oil Products Company, Inc., Harrison, New Jersey, James Fritz is now with the development division of the Chemical Warfare Service at Edgewood Arsenal, Maryland, with the rank of lieutenant. He is succeeded by Earl P. McGinn. Mr. McGinn has formerly been associated with the Minnesota and Ontario Paper Company, Curtis Publishing Company, Champion Paper and Fibre Company, and St. Regis Paper Company. He is a graduate of the New York State College of Forestry, Syracuse, New York, Pulp and Paper, 1932.

◆

▶▶▶ The appointment of *W. I. Galliber* as executive sales manager of the Columbia Chemical Division of Pittsburgh Plate Glass Company, Pittsburgh, became effective January 1. Mr. Galliher, formerly director of sales, succeeds *Eli Winkler*, who will serve in the capacity of executive consultant.

◆

▶▶▶ Closely associated with the work of the Newsprint Association of Canada, *G. Harold Fisk* has been named special assistant to the Newsprint Administrator, R. L. Weldon, by the Wartime Prices and Trade Board. Mr. Fisk has been granted leave of absence by his company, Stevenson & Kellogg, management engineers, to carry out his new duties.

◆

STAFF CHANGES AT NEW YORK STATE COLL. OF FORESTRY

Two new appointments have been announced by the New York State College of Forestry, Syracuse, New York. Professor Raymond G. Crossman, vocational guidance counselor of the Yonkers High School of Commerce and teacher, has been named registrar and assistant professor, and Professor Lucian P. Plumley, of the New York State Ranger School, was appointed to succeed Professor Harry S. Mosebrook, who was drafted in the Coast Guard.

Professor Crossman succeeds to the office formerly held by the late Professor I. Laurance Lee. He is a graduate of Syracuse University, A. B., 1926; M. A., 1931. He was an instructor in business administration from 1926 to 1931; studied and taught English under Professor Lee's supervision and took training in Teachers' College Graduate School, Columbia University. His work at Yonkers involved teaching, administrative duties, entering new pupils, planning and scheduling the program, and assisting teachers.

Professor Plumley is a graduate of Technical High School of Buffalo, the Ranger School in 1931, and the New York State College of Forestry in 1935. He majored in general forestry, which qualifies him for forest extension service in advising and demonstrating practical forestry to woodland owners.

◆

DR. LIGHT RESIGNS FROM BRYANT—MILHAM NEW PRES.

Allan B. Milham has been elected president of the Bryant Paper Company, Kalamazoo, Michigan, following the resignation from that position of Dr. S. Rudolph Light, who will continue on the board of directors, and serve as vice president.

A son of W. B. Milham, one of the founders of the company, Mr. Milham was a bookkeeper at Bryant

Allan B. Milham

before World War I, and joined the purchasing department following the war. He was purchasing agent for five years, until 1925, when he was transferred to the sales department. Ten years later, in 1935, he was made manager of Bryant's Imperial Division (coating mill). When Dr. Light was made president, last January, Mr. Milham was elected executive vice president and manager of the company.

H. A. SPENCER MADE DIR. OF RESEARCH

Horace A. Spencer, technical director of Knowlton Brothers, Watertown, New York, for the past two years, was appointed director of research of that company on December 1. He has been connected with Knowlton Brothers for the past eight years.

As director of research, Mr. Spencer will have charge of all of the company's research in the scientific field of paper manufacture, including the chemical and physical phases of paper productions, grades of paper, processes, and types of equipment.

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▶▶▶ Assistant chief chemist at the Riverbend (Quebec) plant of Price Brothers & Company, Ltd., *Keith R. Hymmen* has been appointed chief chemist at the company's Jonquiere (Quebec) mill.

◆

▶▶▶ One of the foremost engineers in the field of weighing, *H. W. Hem* has joined The Howe Scale Company of Rutland, Vermont, as research director. Mr. Hem was born in Kansas City, and acquired his technical training there. He began his business career with the Strait Scale Company of Kansas City, in 1909. Prior to joining The Howe Scale Company, he was with the Toledo Scale Company, engineering department.

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▶▶▶ A member of the engineering staff of Ontario Paper Company, Thorold, Ontario, *W. T. Pound* has taken a position as engineer with Sutton-Horsley, Ltd., Toronto.

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▶▶▶ Paper mill superintendent of Howard Smith Paper Mills, Cornwall, Ontario, *Donald R. Dick* is now a captain in the Canadian Army.

◆

CHANGES AT CAN. INTERNATIONAL PAPER COMPANY

W. T. Bennett, plant engineer at the Gatineau (Quebec) mill of Canadian International Paper Company, has been appointed assistant chief engineer of the company and transferred to the head office at Montreal. G. D. Davidson, assistant plant engineer of the New Brunswick International Paper Company at Dalhousie, New Brunswick, is his successor.

H. C. Lee, mill engineer of the Gatineau mill of Canadian International Paper Company, succeeds Mr. Davidson, and K. F. Bews, chief draftsman, has been appointed mill engineer, replacing Mr. Lee.

Why risk Interruptions

IN AUTOMATIC CONTROL?

It's easy to *play safe* with Quick-Check Maintenance Cards!

Have you ever considered what it would mean to operate your plant without automatic temperature controllers? More work... more waste... curtailments in output!

Foxboro now offers you an easy way to forestall neglect, or accidents to instruments that might necessitate such costly operation. Without charge, you may obtain Foxboro Quick-Check Cards outlining essential maintenance steps for each major type of instrument in your plant.

Attached to your installations or conveniently filed, these 9" x 11" Quick-Check Cards map out an easy routine that will keep instruments operating at top efficiency for the duration... save the uncertainties of wartime replacements or repairs... help to prevent interruptions in instrument performance. Equally useful for Foxboro or any other standard instruments.

Write us, specifying all different types of instruments you use. **The Foxboro Company, 158 Neponset Ave., Foxboro, Mass., U. S. A.** Branches in principal cities of U. S. and Canada.

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S. R. ARMSTRONG

Samuel R. Armstrong, former vice president and general manager of the New York and Pennsylvania Company, Inc., New York City, passed away December 10.

Born in Sullivan County, Pennsylvania, Mr. Armstrong entered the paper industry as a youth, working for plants of the New York and Pennsylvania Company in Willsboro, New York; Lockhaven, Pennsylvania; and Johnsonburg, Pennsylvania. Following the death of his uncle, M. M. Armstrong, part founder of the business, some 30 years ago, Mr. Armstrong became vice president and general manager of the concern.

In 1916, he built the plant of the Mattagami Pulp and Paper Company at Smooth Rock Falls, Ontario, and became general manager. Later he was technical advisor at the Abitibi Power and Paper Company plant at Iroquois Falls, Ontario. He retired 8 years ago.

Mr. Armstrong was 68 years old. He is survived by his widow, a son, and two daughters.

◆

▶▶▶ Speaker of the Canadian Senate, *Senator Georges Parent,* of Quebec, passed away December 14. In addition to numerous other important positions on the directorates of various Canadian industrial companies, he was vice president of Donnacona Paper Company, Ltd., Donnacona, Quebec. He was 62 years of age, and is survived by his widow and two sons.

◆

▶▶▶ Founder of the firm of M. Gottesman & Son in 1886 and a pioneer in the pulp and paper industry, *Mendel Gottesman* passed away in New York City, December 16. His work in the charitable field was well known, doing most of it through the Tree of Life Foundation. He was 83 years of age. Surviving him are four sons and one daughter.

◆

CLIFFORD T. PERKINS

Clifford T. Perkins, assistant superintendent of the Westbrook, Maine, mill of the S. D. Warren Paper Company, passed away December 25. He was 47 years old.

Mr. Perkins was graduated from Bowdoin College in 1915, at which time he was employed by the Penobscot Chemical Fibre Company, Great Works, Maine. He later became associated with the S. D. Warren Paper Company and has been with that company for the past 24 years. He spent several years in the company's Boston office, later served as manager of the Copsecook mill at Gardiner, Maine, and for the past six years had been assistant superintendent at Westbrook.

Surviving Mr. Perkins are his widow and two daughters.

◆

ROGER WILLIAMS, SR.

Roger Williams, treasurer and director of Draper Brothers Company, Canton, Massachusetts, passed away December 14. He was widely known among the paper mills, among which he numbered many customers for papermaking felts manufactured by his company.

Mr. Williams was born in Canton. He was graduated from Technology in 1895, and entered the business established by his grandfather in Canton.

He was 68 years of age. His widow and three sons survive.

◆

BENJAMIN ANDRESS

Benjamin Andress, chief engineer of the Algonquin Paper Corporation, Ogdensburg, New York, passed away December 28 at the age of 69.

Mr. Andress was born in Prescott, Ontario, and at one time taught in Canadian rural schools. He became chief engineer at the Algonquin mill about 8 years ago, and previous to that, had been employed as an engineer on various freighters in the Great Lakes for about 20 years.

His widow, one daughter, and one son survive.

◆

V. HOLLINGSWORTH

Valentine Hollingsworth, president of Hollingsworth & Vose Company, East Walpole, Massachusetts, passed away on December 10.

He is survived by his widow, two sons, one daughter, and a brother, Amor Hollingsworth, chairman of the board of Tileston & Hollingsworth Company, Boston.

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▶▶▶ *Major C. R. Townsend,* of the Canadian Forestry Corps, is reported to have lost his life recently on active service, crossing from England to Canada. Major Townsend was a graduate forester from the University of New Brunswick. He was employed by several pulp and paper companies, and did some special work for the Woodlands Section of the Canadian Pulp & Paper Association. He enlisted at the outbreak of the war and served three years with the Canadian Forestry Corps overseas.

◆

C. K. BERGMAN

Word has just been received in this country of the passing of *C. K. Bergman,* chief of the famous Central Laboratory in Helsingfors, Finland. He was 61 years of age and was associated with the laboratory since 1919 (when it was still located at Abo). Under his guidance the laboratory, which was sponsored by the Technical Committee of the Finnish Cellulose Association, grew steadily and maintained a very efficient technical staff.

Director Bergman was very prominent in the affairs of the Scandinavian Pulp and Paper Association, and was especially interested in the evaluation of pulp quality.

◆

▶▶▶ Closing a 26-year association with the Bradner Smith & Company, paper wholesalers, Chicago, *Arthur R. Martin,* its president for the past three years, passed away on New Year's Day. Mr. Martin was 57 years of age. He is survived by his widow and a son.

◆

▶▶▶ President of the Lee Paper Box Company and representative in the Pennsylvania State Legislature, *Edwin A. Lee* passed away recently in Philadelphia at the age of 52. He is survived by his widow, two sons, and a daughter.

◆

JAMES SHANLY

Manager of the paper division of Price Brothers & Company, Ltd., at Kenogami, Quebec, James Shanly passed away on December 18.

Mr. Shanly was born in Montreal. He entered McGill University to study engineering; however, in 1916 he left his studies to enlist with a unit of the Royal Canadian Engineers, going overseas with the rank of lieutenant. He returned to Canada in 1919, and joined Price Brothers as an engineer. He had been connected with that firm at Kenogami ever since. Mr. Shanly was 46 years old.

◆

▶▶▶ Vice president of the Westinghouse Electric & Manufacturing Company, in charge of the company's Lamp Division, Bloomfield, New Jersey, *David S. Youngholm* passed away recently. Mr. Youngholm had been associated with the company for more than 33 years, and was awarded the Silver "W" Order of Merit in

April, 1936, which is the highest award given by the company in acknowledging outstanding service. He was 53 years old, and is survived by his widow.

◆

ROBERT STOBIE

Robert Stobie, former superintendent of the Winslow (Maine) mill of Hollingsworth & Whitney Company, passed away December 10.

Mr. Stobie was born in Heriot, Scotland, and received his early experience in the paper industry in mills of that area. In 1893 he became associated with Hollingsworth & Whitney in Waterville, and except for several years spent in the west and at the Gardiner mill of the company, he has been a resident of Winslow, serving the plant there as superintendent.

He was 85 years old. He is survived by two daughters, Mrs. Helen Buswell, of Urbana, Illinois; and Mrs. Arthur E. Winslow, of Winslow, Maine.

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▸▸▸ Vice president of the Massillon Paper Company, Massillon, Ohio, *John A. Silk* passed away recently. He was 46 years old.

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C. T. PERKINS

Clifford T. Perkins, assistant superintendent of the S. D. Warren Paper Company, passed away December 25. Mr. Perkins was a graduate of Bowdoin College, after which he was employed by the Penobscot Chemical Fibre Company, Great Works, Maine. He later became associated with the S. D. Warren Paper Company, where he was employed 24 years, working for several years in the company's Boston office and later serving as manager of the Copsecook mill at Gardiner, Maine. For the past six years he had been assistant superintendent.

Mr. Perkins was 47 years of age. He is survived by his widow and two daughters.

◆

▸▸▸ Retired president of the McDowell Paper Mills, Manayunk, Philadelphia, *Charles McDowell*, 76, passed away at his home in Philadelphia on December 20. Mr. McDowell retired in October, 1939, after he had sold his interest in the company.

◆

DR. H. E. HOWE

Harrison E. Howe, editor of *Industrial Engineering Chemistry* and *Chemical and Engineering News* of the American Chemical Society, passed away at his home in Washington, D. C., recently. He was well known for his articles and books.

IT LOOKS GOOD ON PAPER

. . . any way you figure!

Watch Towmotor do its stuff in any warehouse or mill and you'll really get an eye-full of efficient, economical paper handling. Rolls . . . pulp . . . bales . . . they're all the same to this "one man gang." It picks up 1000 to 10,000-pound loads, hustles them around as fast as 10 miles an hour . . . spots them or stacks them as high as 25 feet.

You'll get an eye-full too when you translate this performance into figures. Time saved in loading and unloading, more efficient use of man-power, more usable storage space—that all adds up to days and dollars cut from production costs.

"Tomorrow" will be here before you know it. Be ready for it; get all the facts on Towmotor. You'll find 'em in our free booklet, "The Inside Story." For your copy, write Towmotor Company, 1220 East 152nd Street, Cleveland, Ohio.

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ARMY (E) NAVY

THE 24-HOUR ONE-MAN-GANG

Convention Papers . . . Abridged

Power Teamwork for Victory[1]

PHILLIP W. SWAIN[2]

War Production depends primarily on materials, machines, men, and power. At one time or another every one of these has been a limiting factor—except power. We believe that this sufficiency of power for wartime needs can be maintained through the next two years of supreme struggle on the military and industrial front, if power engineers will bend every energy to the task ahead.

All agree that the necessary pooling of generating capacity must be considered on a regional basis. In general, it is not practicable to feed one large geographical area from another across natural boundaries.

As of July 1, 1942, public supply sources had a total installed capacity of 45,337,000 kilowatts. New installations during the first half of 1942 totaled about 1,300,000 kilowatts, and will continue at about the same rate for the remainder of the year. By January 1 approximately 46,500,000 kilowatts will have to carry aggregate peak loads of about 37,500,000 kilowatts, leaving an average reserve margin about equal to that of 1941.

New installations under way with the necessary priorities total about 5,300,000 kilowatts for operation before the end of 1943. (Some few of these plants will not start until 1944.) No further building is authorized so our national generating plant will climb to slightly over 50,000,000 kilowatts, and stay there for the "duration," if plans are followed.

Except in the temporary water shortage in the Southeast last year, curtailment of non-essential use and rationing has not been necessary, nor is it in sight this year.

To prepare for pooling of generating capacity in their territories, utilities are ordered by WPB (Limitation Order L-94) to survey the areas served, list all industrial plants over 100 kilowatts, establish the approximate number of kilowatts and kilowatt hours that might be available in the pool, and estimate what materials and labor interconnection would require.

Another part of the same order provides for a declaration of emergency within a definite geographical area when a shortage occurs or can be foreseen. After such declaration, operation of generating equipment can be dictated on the basis of maximum benefit to war production without considering the usual factors of cost or safe margins of reserve.

The first step in maximum utilization has already been carried out in part. For more than twenty years the utilities have been building integrated systems with transmission ties. These have made the reserves of one plant or system available to others.

A preliminary survey made by Edison Electric Institute indicates that something like 3,000,000 kilowatts of non-utility reserve generator capacity might be available from complete pooling, insofar as is practical, of all isolated installations in the country. In such studies all plants under 100 kw., all dc generation, and all plants of disproportionately high cost are eliminated.

There are other practical limitations on interconnection. Some plants with old or inefficient equipment may not be able to run at full load. Others may need all their capacity for war production on the spot. Deficiency in boiler capacity or fuel supply may limit maximum output. Needed repairs and lack of parts or skilled labor may prevent full utilization of nominal plant capacity.

For feasible interconnections rough estimates of cost for transformers, switches and accessories average less than $20 per kilowatt.

Joint operation of industrial and utility generators is an old story to many power men, but most existing interconnections were made primarily for economic reasons. Today the incentive comes from the power needs of the war effort.

Tieing an industrial power plant to a utility system involves a lot more than installing transformers and connecting a few wires. In fact the technicalities involved in a correct tie are rather complex as evidenced by the fact that the section of which this paper is a summary devotes 11 printed pages to some of the electrical and mechanical details involved.

Too often discussions of power supply look upon steam wholly as a means of producing electricity. The error will be obvious to any paper-mill man and also to anyone who knows that American industry consumes 50 per cent more steam for process and heating than do all the central stations for electrical generation.

Both in peace and war the exchange of steam between plants is frequently dictated by the availability of excess waste or by-product fuel. Outstanding examples are found in the West Coast lumber mills whose huge output of sawdust and hog fuel generally far exceeds the fuel demands of the mills. That means either fuel or steam for sale. A case in point is a lumber mill in the state of Washington that furnishes steam to a local gas plant.

The present major fuel-oil shortage area lies along the Atlantic seaboard, but the Middle West is affected to a lesser extent.

Coal storage has become a matter of major importance. Every engineer in the East should learn the new tricks in this trade.

For the present the fuel difficulty is purely one of shipping facilities, rather than of production. There's still plenty of oil and coal at the oil wells, refineries and coal mines, although this condition may not last throughout the war.

Thousands of plants have stocks of used and unused parts—valves, fittings, pipes, boiler tubes, shafts, pulleys, gages, etc., some of which may not be needed on the spot in the near future. As the war proceeds such items, as well as major units, will be pooled for the common good. Already, there have been many examples of pooling and swapping.

For example, an industrial plant was about to shut down because it could not obtain immediately certain spare parts for a traveling grate stoker. A paper mill in a neighboring city sold this plant its spare stoker parts to tide over the emergency.

Power plants, both utility and industrial, must prepare to share these shortages—to let go men who have been considered essential—to hire and train others who might seem to have less than the minimum requirements for critically important jobs. And one power plant, too, must prepare to lend key men to the neighboring power plant to tide over some emergency.

All this means that power executives everywhere must break away from lifelong habits and adjust their procedures to the requirements of war.

Commenting on the situation, the steam superintendent of a large Canadian paper mill said that employers became too choosey in the days when the workers' market was overcrowded. He continued, "All that is changing, and there is no reason at all why hundreds of jobs cannot be handled by men rejected by military service, or men over the age limit."

The time has arrived when every chief power engineer must be, among other things, a real teacher.

(1) This paper is a high-spot summary of a 32-page special section appearing under the same title in September *Power*, 1942. Authors of original section were Editor Swain and Associate Editors Tucker, Annett and Rowley; (2) Editor of *Power*, New York, N. Y.

Mechanization of Paper Packaging

CHARLES STEVENS

Morrow Manufacturing Company, care of Maxson Automatic Machinery Company

As far as the packaging of paper products is concerned, it may be granted that some form of wrapping offers the most satisfactory means of protection.

Mechanized packaging by wrapping is the only means whereby the conservation of all auxiliary equipment may be affected. It is the only system that will streamline the entire process all the way through from manufacturing to shipping carrier.

In order that a wrapped package of super-

Some of the papers presented at the fall meeting of the **Technical Association of the Pulp and Paper Industry** held at Boston, Massachusetts, September 29-October 1, 1942, have been abridged, and published in each issue. The final installment will appear next month.

imposed sheets of loose paper be secure, a combination of the contents and its enclosing wrapper must unite to form a rigid package. First, the sheets must be squarely stacked and held thus while the wrapper is secured around them. Second, the stack must be compressed to expel the air from between the sheets while in the process of wrapping and sealing. By this method an article that has no rigidity within itself is transformed into a solid block. Secure sealing further protects the package from distortion.

Absolute protection to the contents must also involve sealing against the infiltration of dust and dirt. If moisture content control is sought, secure sealing becomes further essential. Protection in storage against crushing or distortion is best accomplished by a square, tightly sealed package.

The package must present the maximum in eye appeal after all handling in getting it to the user.

To mechanize this phase of the production line is the last step in streamlining the operation of paper manufacture and finishing.

The Morrow-Stevens wrapping and sealing machine is now widely used throughout this country.

The unit is compact, self-contained, and fully enclosed. It is entirely automatic in its operation from supplying the correct amount of wrapping material from roll stock to ejecting completely wrapped and sealed packages right up onto the cartoning bench. The packages, as they come from the unit, are dry and ready for finish packing.

The blocks or reams of paper are slid into a loading magazine. From this point on, the mechanisms act in timed sequence to complete the wrapping, sealing, and ejecting without further attention.

The operation is so set up that the loading magazine holds three reams, one behind the other. In this way, the operator pushes the line into feeding position. When the first ream reaches the proper point, the unit automatically starts and continues until the package is completed. It will again automatically stop if no stock is in the feeding position. A thousand reams may be fed into the unit and wrapped consecutively without interruption—then the operator may, for example, walk away and return several minutes later and resume feeding without touching the machine's controls in the meantime.

The methods employed to guide the ream through the unit in the process of feeding, wrapping, sealing, and ejecting are self-jogging. The stack is thus maintained square and even.

The stack held compressed under several hundred pounds pressure while the wrapper is sealed around it expels the air from between the sheets and prevents wrinkling of the wrapper when it is later stacked. The square package, with no superfluous wrapper or flaps, stacks evenly in storage and cartons.

Sealing the end flaps against the end of the ream presents a neater appearing package at a marked saving in wrapping material.

The rated production capacity is 900 packages per hour in sizes from 8 inches by 10 inches through 8½ inches by 14

Early American Paper Makers

Papermaking has been an American industry for two hundred and fifty-two years. Weaving textiles remained a household occupation until relatively recent times. The major growth of woolen manufacturing dates from the middle of the 19th century. Among the pioneers of this era were the ***Draper Brothers.***

At the time they first began to weave felts for papermakers, they were already expert in their knowledge of wool and the blending of wools for various purposes.

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inches inclusive; and operation records reveal overall efficiency of 95 per cent to 115 per cent. In one mill, production records indicate 6,000 to 6,400 packages per day (8 hours overall time) in above size range. Another mill reports 95,000 pounds in 21 hours per day continuous duty month after month. Another reports a total cost of sealing cut sizes of 9 cents per 100 pounds, including wrapper, glue, labor, depreciation, maintenance, interest.

In another mill, one girl feeds the machine, one girl labels the packages as they travel up the chute—one girl fills the cartons and one man piles the cartons and trucks them away. This crew of girls floats, and each girl is on one particular job 15 minutes.

Another user reports a saving of 36 to 40 workmen each 21 hours on the wrapping and packing operation alone. This user also tells us that their sheet cutting is stepped up in the streamlining operation created by the wrapping and sealing unit.

The Flow Spreader

SAMUEL M. BRATTON[1] and FRANK M. SANGER[2]

The "flow spreader" is a section of a paper machine to evenly spread the stock the full width of the machine as it approaches the formation point, keeping the currents under control, thereby giving the slice an opportunity to gage the thickness of the sheet without any interference from irregular actions such as found in the previous methods of distributing the stock to the forming point.

Articles have been published in Technical Association Papers 24:510-518, 651-655, June, 1941, where various slices and headboxes have been discussed. One important

(1) Chief Engineer and (2) Assistant Chief Engineer, Pusey & Jones Corporation.

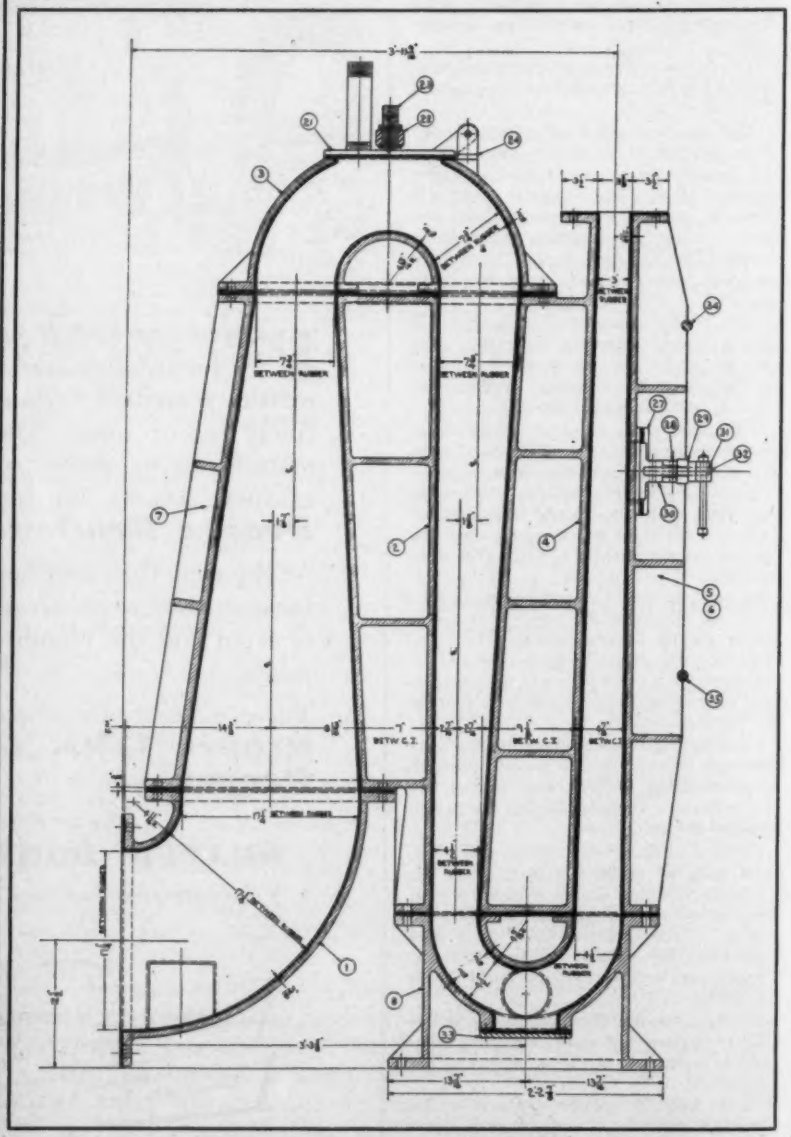

Fig. 7—Neoprene or rubber-lined flow spreader.

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Layne Wells and Pumps are backed by more than sixty years of outstanding success in all parts of the world—and even under the most adverse conditions, they constantly maintained their enviable record of highest efficiency and long life. Layne's activity is now nearly 100 percent for the war effort, but when peace returns, installations for municipal and private industries will be resumed. In the meantime, every effort is being made to supply parts and repair service to all existing installations.

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point has been brought out, other than the breaking up of the currents, why the stock should be conveyed to one central point—i.e., if more than one screen is used there will be just as many different degrees of screened stock. The plates will usually be slightly different, some more worn than others, and should the front side screen have new plates and the back side screen worn plates then there will be a difference in the formed sheet. The quantity of shower water will also vary.

The flow spreader may be described as a carefully designed hydraulic nozzle. The opening at the slice being in the form of a rectangle it is necessary to start the flow spreader in a rectangular form by using a transition fitting at the inlet end to change the flow from a circular cross section pipe to a rectangular section of the same width as the pipe diameter and of the same area. The flow spreader changes this rectangular section progressively and gradually to the full width of the machine with a corresponding reduction in depth. The discharge area is usually less than the inlet area. The spreading length is according to the width of inlet and spreading angle within limits that will permit uniform spreading of the flow. It has been shown that a rectangular pipe, two opposite sides of which are parallel, and the other two diverging will produce minimum turbulence if the angle of divergence is kept below a definite limit. If the two parallel sides are made to converge so as to maintain the same area or reduce the area the divergence angle of the other two sides may be increased accordingly. This principle has been utilized in the design of the flow spreader.

The flow spreader is made of steel or cast iron, two opposite sides of which diverge at a constant angle to full machine width, and the other two sides converge so as to give slightly decreasing area or increasing velocity of flow to the point of discharge to

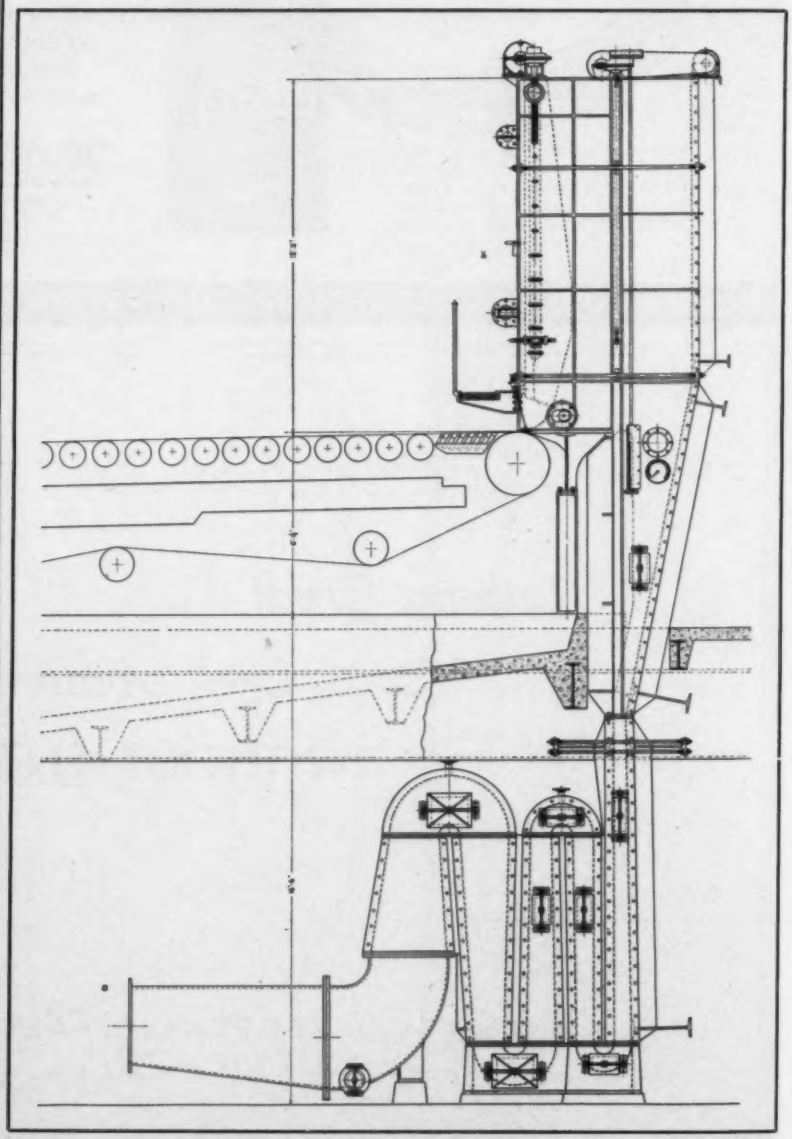

Fig. 8—Flow spreader and slice on fourdrinier machine.

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WHY are so many paper mills replacing the old stuffing box steam fits with Johnson Joints? For two sound reasons: 1st, The Johnson Joint ends all steam fit troubles; 2nd, it helps to speed up plant production.

HOW does it end all steam fit troubles? By means of a simple, rugged construction that never needs to be oiled, has no packing at all to wear out, adjusts itself automatically for varying pressure, and absorbs both lateral and angular misalignment without loss of operating efficiency.

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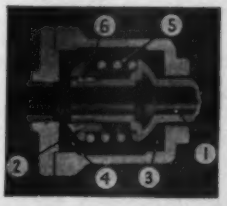
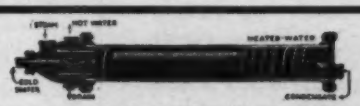


● Though the Johnson Joint was introduced less than ten years ago, over a hundred paper mills now use 50 or more; over fifty mills have purchased from 100 to as many as 800.

Nipple (1), fastened to roll. Sliding collar (2), keyed (6) to nipple. Carbon graphite seal ring (3) and bearing ring (4), which eliminate oiling and packing. Spring (5), for initial seating only; joint is pressure sealed.



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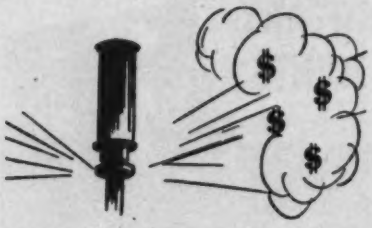

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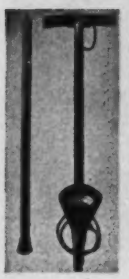

It's a matter of control. Too little steam slows up paper making. Too much causes paper damage. Control of steam to maintain desired progressive temperature changes in the drying roll train, is assured by the constant use of the Cambridge Surface Pyrometer. This rugged and convenient instrument accurately determines the surface temperature of moving or stationary drying and calender rolls.

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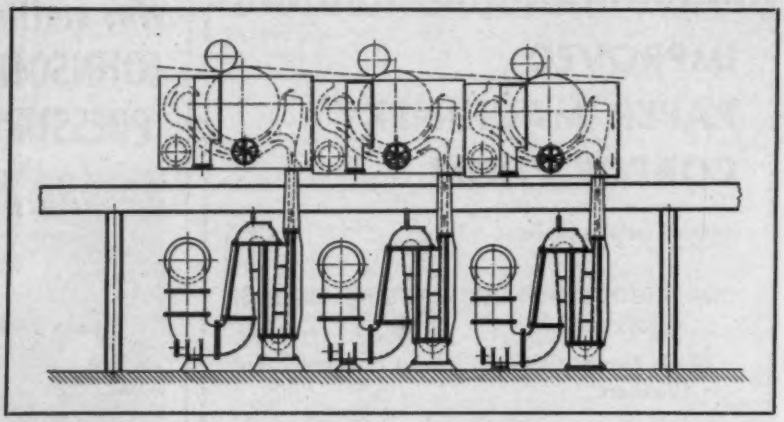

Fig. 3—Flow spreader and stream flow vat.

the slice. It is usually folded on itself to conserve space and rubber or Neoprene lined to prevent corrosion and facilitate cleaning. This folding on itself results in 180-deg. turns at the top and bottom of each pass. The top of each pass constitutes an ideal type of air trap. Air trapped at this point is continuously vented to the atmosphere by means of one or more generous sized pipes leading upward to a height sufficient to prevent flow of stock. The rubber or Neoprene lining provides a smooth surface of a character to which pulp fibers have little tendency to cling, and is easily washed. It is corrosion-proof and cannot contaminate or dirty the stock, and by preventing any contact with metallic surfaces insures long life for the equipment. All joints are carefully formed so as to prevent ledges or corners where stock fibers might hang up, or cause disturbances of the flow. The flow spreader keeps itself clean by the uniform velocity but ample provision is made for easy washup or inspection by means of quick opening doors located so that all surfaces can be reached by a direct stream from a hose.

Flow to the flow spreader must be in the machine direction, and any turns or elbows at right angles to machine direction must be followed by sufficient straight pipe or other means of correcting any unevenness of flow caused by such turns or elbows.

When applied to a fourdrinier machine the flow spreader is placed directly below the slice and connection made to compartment just back of the slice from which the flow is over an adjustable dam to the slice. Flow spreaders have been installed on fourdrinier machines from 100 to 210 inches in width, making kraft bag and wrapping, liner board, photographic papers, and napkin and tissue papers, at speeds up to over 1400 fpm. Improved and more uniform formation has resulted from every installation, and space around the slice conserved.

When applied to a cylinder machine vat, the flow spreader is placed under each vat and the discharge end connected to the vat by a suitable fitting of full vat width. Discharge velocity from the flow spreader must be reduced either in the connecting fitting, or in approach passages in the vat, before releasing into the open pond at the forming point to prevent turbulence, and this reduction must be at a rate below a definite maximum. The flow spreader will deliver the paper stock uniformly across the entire machine width and a level uniform sheet will be the result. Wing dams and other makeshifts to level the sheet are entirely unnecessary.

To provide uniform dispersion of stock to the flow spreader and eliminate as much air as possible, flow to the flow spreader is through an upflow headbox in which stock is delivered from the pmup to the bottom of an inverted cone. It rises in this cone at constantly decreasing velocity and overflows into an outer cone, then downwards in the outer cone and delivered from the bottom of the outer cone to the underfeed pipe and thence to the flow spreader. This provides a headbox in which no dead spots can exist with a quiet pond of large area from which a maximum amount of air can be eliminated. Many such installations of flow spreaders and upflow headboxes have been made on single and multiple cylinder paper machines making rope and kraft specialties, chestnut corrugating boards, roofings, and folding boxboards, and results obtained have more than justified the installation.

The upflow headbox can also be applied to the fourdrinier installation; another step in taking out air or turbulence just before entering the flow spreader thereby assuring an even flow and air-free stock to the slice.

On installations already in operation the following points have been noted:

1) More even caliper across the sheet.

2) Less adjustment of slice to eliminate wet streaks.

3) Less flocculation resulting in better formation and bursting strength.

4) Elimination of perforated boards, rolls, racks, and flow eveners, which accumulate lumps thereby reducing the paper breaks.

5) All wetted surfaces rubber or Neoprene lined preventing accumulation of slime, almost entirely eliminating shutdowns for washup.

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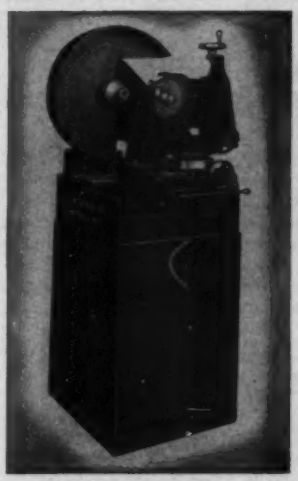

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- "Priming Methods" — 4-page folder describing eight best methods for priming centrifugals.
- "Hydraulic Data"—8-page reference folder of definitions, tables, formulae—heads, pipe and fittings, friction, etc.
- "New Pump vs. Old Pump"—2-page sheet showing how to figure operating costs, correct pipe sizes, etc.
- "Boiler Feeding & Hot Water"—8-page pamphlet telling how to figure capacities, heads, select proper pump, etc.
- "Ground Wood Pulp Mill"—4-page folder describing process. Indicates pumping equipment and where used.

Also eight additional sheets and pamphlets covering all normal pumping requirements in the main types of paper mills.

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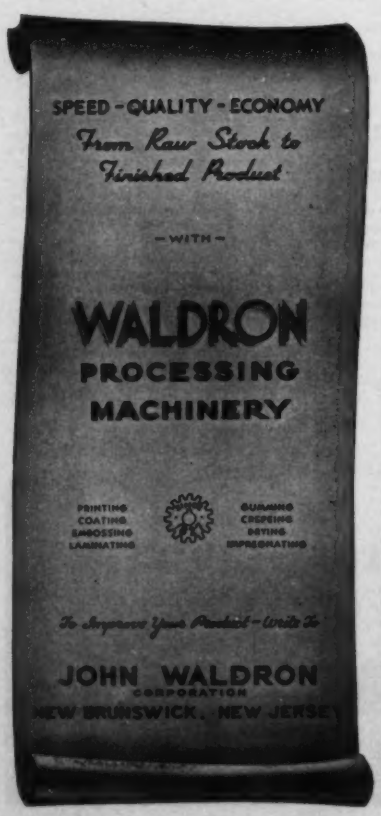

This is the tenth installment of abridgments of papers presented at the annual meeting of the **Technical Association of the Pulp and Paper Industry,** held in New York City, February 16-19, 1942. Previous installments have appeared consecutively in each issue, except November, and will be completed next month.

The Colored Materials of Alkaline Cooking Liquors*

GLENN C. KIMBLE
The Gardner Richardson Company

Since alkaline white liquors have only a small amount of color, it is obvious that the dark color of waste liquors must be produced during the cook by the action of alkali on the wood constituents. Although the reactions taking place are not fully understood, recent investigations have extended our knowledge of the chemical process to a considerable extent.

The major organic constituents of alkaline black liquors are fats and resins, lignin, oxyacids and lactones from the breakdown of carbohydrates, and some acetic and formic acids. Summarizing values for kraft and soda liquors as quoted by Cirves (Cirves, Francis J., *Paper Trade J.* 91, No. 19:53-56, Nov. 6, 1930) and alkaline black liquor contains the following materials:

Constituent	Percentage on Basis of Total Organic Matter
Fats and resins	1–7
Lignin	50–55
Oxyacids and lactones	30–40
Acetic acid	Trace–6
Formic acid	Trace–6

Thus, nearly half of the organic matter is in the form of strong organic acids.

Seasoned sprucewood was used throughout except for the study of wood species. The sticks were barked, reduced to ¾-inch chips, screened, mixed thoroughly, and stored in bags, each containing one digester charge of 4722 grams of wood (oven-dry basis). Cooks were made in a stainless steel digester which was equipped for liquor circulation and indirect steam heat. The following temperature schedule was used:

Time, hr.	Temperature, C.
0	25
0.5	144
1	164
1.5	170
5.5	170

Liquor samples were taken at periodic intervals from 0.5 to 5.5 hours from a valve in the circulating line, through a water-cooled copper coil. The liquor ratio was 5.5 pounds of total water per pound moisture-free wood; the sulphidity was 33.3 per cent for kraft, 0 for soda. The active alkali was 33.3 per cent for soda, and 27 per cent for kraft (calculated as sodium hydroxide). The effective alkali was lower, however, as considerable amounts of unused alkali were removed with the liquor samples. These conditions produced kraft and soda pulps of approximately the same lignin content which, in view of the importance of lignin in liquor color, made the black liquors comparable. The yields and lignin contents for two cooks were as follows:

Cook	L–2	L–4
Process	Soda	Kraft
Yield, moisture-free unscreened pulp, per cent	39.39	46.00
Yield, moisture-free screened pulp, per cent	39.28	45.74
Lignin in screened pulp, per cent	4.01	3.54

The alkaline black liquors used in this work were so highly colored that it was necessary to dilute them to 50 or 100 times the original volume before transmittance determinations could be made in a conventional absorption cell. If Beer's law were obeyed, the k values multiplied by the dilution factor would give the same absorption spectra as the original liquors. When water was used as a diluent this law did not hold, the log k-wavelength curves becoming less steep with increasing dilution. Under these conditions comparisons of color at different concentrations would be invalid. A thin-film absorption cell was constructed in which a film of undiluted black liquor was contained between two optically flat disks which were held apart by platinum shims. Using this cell and dilutions of different concentrations in the conventional cell, it was found that black liquors would follow Beer's law very closely at all wavelengths if they were diluted with colorless white liquors of approximately the same alkalinity and sulphidity as the original cooking liquors. Use of such diluents also prevented any errors due to *p*H effect on colored materials which act as acid-base indicators. The color of all separated liquor fractions was determined in white liquor solution. Unless otherwise specified, all k values were calculated to the original undiluted liquor basis and therefore are directly comparable.

The white liquors used as diluents were colorless solutions prepared from reagent grade chemicals. The color in the cooking white liquors was negligible when compared with the total liquor color, but would have been a source of error if they had been used for dilution.

The determination of the organic constituents in alkaline black liquors is a complex problem and complete or accurate methods have never been developed. The methods used in the analysis of these liquors were patterned after those by Brauns and Grimes (Brauns, F. E., and Grimes, W. S., *Paper Tr. J.* 108, No. 11:40-43, March 16, 1939; *Tech. Assoc. Papers* 22, No. 1:574-577, 1939).

Alkalinity was determined by potentiometric titration. Carbohydrates were estimated by gravimetric solids and ash de-

(*) A portion of a thesis submitted in partial fulfillment of the requirements of The Institute of Paper Chemistry for the degree of Doctor of Philosophy from Lawrence College, Appleton, Wisconsin, 1941.

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terminations. As expected, these values showed no relation to color. In general, they verified the conclusions reached by Brauns and Grimes.

The following procedure was used to determine acid-insoluble organic matter in the soda black liquors.

Twenty-five cc. of liquor samples were pipetted into centrifuge jars and diluted to 75 cc. with water. Each diluted sample was made acid with 6 N hydrochloric acid, stirred thoroughly, and centrifuged. The supernatant liquor was filtered through an A-2 porous-bottom porcelain crucible, using suction. The decanted liquor was replaced with distilled water and the precipitate stirred. After centrifuging, the wash water was decanted as before. This was repeated until the first liquor and four portions of wash water were collected in the suction flask. In all cases, the last wash was colorless. If necessary, a drop or two of hydrochloric acid was added to prevent colloid formation. This acid-soluble fraction was diluted to a volume 20 times that of the black liquor sample. To reach this volume, enough strong white liquor was added to neutralize the acid and make the final volume equal in strength to the cooking white liquor. This solution was used for determining the transmittance of the acid-soluble fraction of the liquor.

Meanwhile, the precipitate was transferred to a crucible, where it was washed with water until the filtrate was neutral to litmus paper. This required a week or more but was necessary to prevent the formation of a dark horny substance on drying. After thoroughly washing the precipitate could be dried to a brown, crumbly powder. When the washing was finished, the precipitate was dried at 105 C. to constant weight in a weighing bottle.

The precipitates weighed were mostly lignin, but were contaminated by acid-insoluble carbohydrates, extractives (such as resin acids), and, in kraft liquors, small amounts of free sulphur. The amount of lignin in these precipitates was determined by a methoxyl determination. The methoxyl content of purified lignin from black liquor was found to be 14.7 per cent for soda and 14.42 per cent for kraft. Using these values, the lignin content of each liquor sample was calculated from the weight and methoxyl content of the acid precipitate.

An exception to this procedure was made for the 5.5-hour liquors. Apparently the low methoxyl contents of these precipitates were not representative of the lignin. According to Brauns and Grimes (Brauns, F. E., and Grimes, W. S., *Paper Trade J.* 108, No. 11:40-43, March 16, 1939; *Tech. Assoc. Papers* 22, No. 1:574-577, 1939), lignin may be partially demethylated by severe cooking. For this reason, the methoxyl contents of the 4.5-hour liquor were used as an approximation in calculating lignin content of the 5.5-hour liquors.

In the study of kraft cooking a further separation of the acid-insoluble material was made in an attempt to obtain more information about this fraction. The precipitation and washing in the centrifuge jar were carried out as for the soda liquors. A method was devised for extracting the ether-soluble material from the precipitate before drying and weighing. The ether extract was divided into aliquots. One part was evaporated, dried, and weighed. The other was extracted with white liquor in a separatory funnel, the color gone entirely into the alkaline solution. The white liquor solution of the ether-soluble material was then used for a transmittance determination.

The dry ether-soluble fractions had methoxyl contents of 11 to 12 per cent. Evidently they contained a large proportion of lignin in addition to the resin acids, fats, waxes, and other acid-insoluble extractives.

Several of the liquor samples were heated for 3 hours at 170 C. in a stainless steel autoclave to determine the effect of heating on the color and chemical analysis. Air was replaced with nitrogen to prevent oxidation effects, and precautions were taken to keep the volume on a quantitative basis. A wax bath was used to prevent burning. Except for the 0.5-hour liquors (which contain little lignin), the liquors are darkened markedly by heating. The analyses showed a decrease in the weight of lignin which could be recovered by the analytical method. This explains the apparent decrease in the lignin content of the black liquor during the last hour of the kraft cook. The reheated kraft liquors show decrease in the methoxyl content and a slight increase in the amount of ether-soluble material.

The 2.5-hour liquor samples contained large amounts of lignin, yet they had not undergone such severe heating as the later samples. These liquor samples were used for the preparation of purified soda and kraft lignins (alkali lignin and thiolignin). This was done by precipitation with acid,

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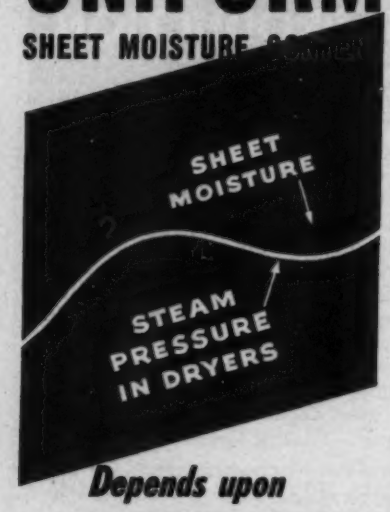

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solution in dioxane, and precipitation in ether as described by Ahlm (Ahlm, C. Edward, *Paper Trade J.* 113, No. 13:115-119, Sept. 25, 1941). The products were finally washed with petroleum ether and dried at room temperature for several days in a vacuum desiccator over sulphuric acid. The dry products were light cream or tan, but gave highly colored alkaline solutions.

Solutions were made of alkali lignin in soda white liquor and of thiolignin in kraft white liquor. Part of each solution was analyzed optically and chemically; the other part was heated 3 hours at 170 C. and then analyzed. The following methoxyl contents were determined for these preparations:

	Methoxyl (per cent)	
	Soda	Kraft
Precipitate from black liquor	14.31	13.95
Purified lignin:		
Original	14.65	14.42
Precipitated from white liquor	14.16	14.33
Heated 3 hr. in white liquor, then precipitated	15.34	13.27

After heating, only 79.2 per cent of the soda lignin could be recovered by the acid precipitation. Analysis of the white liquor solutions of kraft lignin shows that, after the ether-dioxane precipitation, the analytical method recovered 93.3 per cent of the thiolignin; the remaining 6.7 per cent was contained in the acid- and ether-soluble fractions or was lost mechanically. However, after cooking the purified lignin in white liquor, only 72.2 per cent could be recovered, about 20 per cent becoming ether soluble and 8 per cent acid soluble or lost. Thus it appears that, if black liquors are heated in the absence of the pulp, lignin is degraded faster than in an actual cook. Further, if lignin is cooked in white liquor with no other organic material present, the degradation is still faster.

In the preparation of purified lignin two other fractions were obtained. A small amount of carbohydrate material which had not been degraded sufficiently to be acid-soluble was filtered from the dioxane solution of the lignin. After washing with dioxane, this material was white and produced no measurable color in white liquor solution. The other fraction was the dioxane-soluble material which did not precipitate in ether. Its color and amount were very close to the values obtained for the ether-soluble fraction in the analysis of kraft liquors. In the investigation of soda liquors a portion of this material was heated in white liquor solution. It did not darken as the lignin did in this treatment.

Absorption coefficients of the fractions investigated show that lignin is darkened but is not changed in hue by heating with white liquor. They also show that a large part of the total liquor color is accounted for by the lignin.

If the color determinations were accurate and if none of the fractions changed in color during the chemical separations, it should be possible to add the absorption coefficients of these three major fractions and obtain the values for the whole liquors.

When this was done, the agreement was found to be quite good, and it can be concluded that the absorption coefficients determined for the separated fractions represents the color of these materials as they occur in black liquor.

Kraft lignin remains constant in color throughout most of the cook, yet is considerably darker than soda lignin. Whatever the cause of the color difference (probably the introduction of sulphur into the lignin molecule) this indicates that the reaction must be almost complete by the time the lignin is dissolved. The data show that when isolated black liquors are heated, the increase in color is caused by a change in the color of the lignin.

The color of the kraft black liquors changed slightly with time, but not enough to interfere with the experimental work. The soda liquors, however, changed greatly on aging. The reaction was fairly rapid for diluted solutions, the color reaching an equilibrium after 3 weeks. The color variations were traced to two sources. The hue of the lignin was slightly altered, the log k-wavelength curve rotating around wavelength 470 μ. The major change, however, was a decrease in the absorption coefficient over the whole spectrum for the liquor samples taken early in the cook. This indicated that an unstable colored material was disappearing. It was found that this fugitive color reached a maximum at one hour and was completely destroyed by one hour of cooking after maximum temperature was reached, by reheating the liquors, or by aging diluted liquors. Because the absorption coefficient of the lignin did not change at 470 μ, k at this wavelength was used in following the course of the cook. The use of aged solutions for color determinations eliminated interference from the unstable color.

Comparative kraft and soda cooks were made on several species by the pulping class of The Institute of Paper Chemistry.

Transmittance readings for 100 to 1 dilutions with white liquor for the final liquor samples from kraft cooks show that the widely different extractives in spruce, jack pine, and loblolly pine are of only minor importance in liquor color.

Absorption coefficients furnish one further comparison of the liquors. The ether-soluble material from the lignin precipitate is nearly the same for kraft and soda and for both species; the acid-soluble color however, shows a sharp difference between the two processes, and close similarity for the two woods in either process. This indicates that the wood constituents from which this acid-soluble color is formed are available in either spruce or jack pine. Since spruce has only a negligible amount, if any, of tannins and phlobatannins, these materials evidently do not contribute much acid-soluble color in alkaline cooks of these commonly used woods. It has already been shown that this color does not come from lignin; it could be composed of humic material formed from sensitive carbohydrates.

Alkaline black liquors are so dark that direct examination is useless. However, since the hue does not change, a single transmittance measurement at an effective wavelength between 450 and 500 μ would give all the information of any value in comparing liquor samples. This could be made on a water dilution (about 100 to 1) by a simple photometric system.

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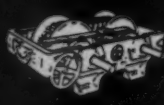

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make-up and the normal variations in wood-liquor ratio, it would not be feasible to attempt to cook to a definite transmittance. The only practical criterion of the degree to which the digestion has progressed appears to be the rate of change of liquor transmittance. Unfortunately, a method based on rate of change would be least sensitive near the end of the cook, and probably would not furnish a critical control. Since the color of the black liquor does not afford any better criterion, it appears that optical methods do not offer much promise for commercial control of alkaline cooks.

Estimation of the Dialdehyde Type of Oxidation in Oxystarches and Oxycelluloses

D. H. GRANGAARD,[1] E. K. GLADDING,[2] and C. B. PURVES[3]

Although the oxidation of starch and cellulose has been extensively studied since the time of Witz (Witz, G., Bull. Rouen., 10, 450, 1882; 11, 177, 1883), the information gained has been almost entirely of a qualitative nature and has dealt in the main with the physical deterioration that oxidation causes in textiles. Further progress in the field would be helped by an increased ability to characterize oxystarches and oxycelluloses and to differentiate those produced by one set of oxidizing conditions from those produced by another. This problem resolves itself into a need for more chemical analytical methods with which to estimate the various kinds of oxidation encountered in practice.

The present article is restricted to the estimation of the dialdehyde mode of oxidation which was found by Jackson and Hudson (Jackson, E. L., and Hudson, C. S., *J. Am. Chem. Soc.* 59, 2049, 1937; 60, 989, 1938) to be the dominant product formed by periodic acid. These authors found that, for example, periodate oxystarch gave 22 and 33 per cent yields of erythrose and glyoxal, respectively, on acid hydrolysis, and also were soluble in methanolic hydrogen chloride. These observations suggested that methanolysis should produce methylerythroside and glyoxal tetramethyl acetal. The latter was readily estimated quantitatively since it was volatile in steam. (Grangaard, D. H., and Purves, C. B., *J. Am. Chem. Soc.* 61, 428, 755, 1939). Methanolysis, followed by a steam distillation from an aqueous alkaline solution (to retain any acidic substances) was therefore expected to isolate the tetramethyl acetal and thereby provide a quantitative estimation of the dialdehyde type of oxidation. Acetals are stable in aqueous alkali although unstable in aqueous acid.

Davidson (Davidson, G. F., *J. Text. Inst.* 31, T81, 1940; 32, T109, 1941) has pointed out the sensitivity of periodate oxycellulose to weak alkali and unpublished data show that yarn oxidized with periodate rapidly decreased in tensile strength even when kept in water at 25 C. and buffered to *p*H 7.0 with 0.5 M sodium acetate.

Oxidations with Periodate

Starches Used

A high grade commercial potato starch with 0.23, 0.55, and 14.9 per cent ash, nitrogen, and moisture, respectively, was used without further purification in preliminary work. Soluble starch was made from it by digestion with 0.5 per cent ethanolic hydrogen chloride according to Baird, Haworth, and Hirst (*J. Chem. Soc.*, 120, 1935) and was purified by precipitating the aqueous solution with alcohol. The product stained clear blue with iodine and after drying in a desiccator had 0.19 per cent ash and 1.7 per cent moisture. Sample weights were corrected for these impurities.

Oxidation of Starches with Periodate

Sodium paraperiodate, $Na_3H_2IO_6$, was used in experiments run on the acid side, and potassium metaperiodate, KIO_4, in those on the alkaline side of neutrality. The oxidizing agent (0.01 mole) was dissolved in 400 cc. of either a molar acetate or a molar phosphate buffer. This buffer was sufficient to limit the change in *p*H during the oxidations to less than 0.1, as measured on a glass electrode. A bath at 25 ± 0.5 C. maintained the temperature of the solution, which was mechanically stirred while 0.002 mole (0.324 gram, corr.) of the soluble starch was added.

The disappearance of periodate in the solution was followed by a slight modification of Fleury and Lange's method (Fleury, P. and Lange, J., *J. Chem. et pharm.*, 27 196, 1933). Aliquots, 15 cc., were pipetted into exactly 10 cc. of N/10 arsenious oxide solution to which 1 cc. of 20 per cent potassium iodide had been added. This procedure promptly stopped the oxidation by reducing all of the periodate. Runs made on the acid side were then buffered with a fixed amount of molar potassium carbonate, those on the alkaline side with freshly prepared sodium bicarbonate or a small lump of dry ice, so that in each case a *p*H of 7.7 to 8.0 was obtained. This *p*H was necessary for the final titration with N/50 iodine solution, which was carried out after waiting for 15 minutes. The difference between the titration and the blank, expressed as X liters of N iodine, was equivalent to $X/2$ moles of periodate.

Periodate Oxycellulose

A dewaxed, high-grade cotton linter was swollen in 10 per cent sodium hydroxide at 0 deg. C., then washed quite free of alkali with water, dilute acetic acid and water, then dried through alcohol and benzene. The internal surface directly available to liquid reagents contained 10 to 20 per cent of all the hydroxyl groups in the cellulose.

In a typical preparation, 5.02 grams (1 mole) were shaken at 20 C. with 7.75 grams (0.852 mole) of sodium paraperiodate and 175 cc. of molar acetate buffer, *p*H 4.2. The product was isolated after 43 hours, when 0.724 mole of periodate had been consumed, and weighed 5.06 grams. This oxycellulose corresponded to 0.00442 mole of oxidant per gram.

(1) Kimberly-Clark Corp.; (2) Research Associate; (3) Associate Professor of Organic Chemistry, Massachusetts Institute of Technology.

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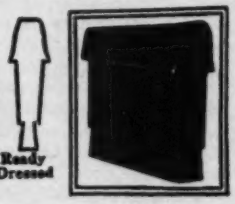

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Estimation of the Dialdehyde Cleavage

The sample, 0.1 to 0.2 gram, of the oxystarch or oxycellulose was boiled under reflux for 18 hours with 25 cc. of methanol containing 2.5 grams of hydrogen chloride gas. After cooling, the solution was made alakaline with 20 cc. of nearly saturated sodium methylate in methanol and the volume was adjusted with methanol to 52 cc. The alkaline solution was quantitatively transferred to a 500-cc. distilling flask with exactly 300 cc. of an aqueous solution containing 6.5 grams of sodium chloride and 1 gram of sodium hydroxide. A water condenser was used in the atmospheric pressure distillation and the first, second, and third 100-cc. volumes of distillate were collected separately. Water, 100 cc., was then added in one portion to the still and a fourth 100 cc. of distillate was collected. A 50-cc. aliquot of each of the four distillates was diluted with an equal volume of 2N hydrochloric acid and hydrolyzed by heating for one hour on the steam bath.

After the methanolysis of the periodate oxystarch or oxycellulose sample, and the steam distillation to give four fractions of distillate, the glyoxal tetramethyl acetal and the cyclic acetal were separately estimated, as glyoxal, by independent 2, 4-dinitrophenylhydrazine and colorimetric methods. These two methods checked each other well except in the case of the third plus fourth fractions of the distillate from oxycellulose. This discrepancy amounted to about 5 per cent of the total recovery.

Some preliminary estimations were carried out on oxycellulose prepared by potassium persulphate in presence of silver nitrate at *p*H 3.7 and 25 C., by acidic hypochlorite, by acidic permanganate, by dilute nitric acid, by dichromate at *p*H 1.1 and 25 C. and by alkaline hypobromite. The permanganate product gave traces of glyoxal which were too small to estimate quantitatively while all the other results were entirely negative.

With periodate oxystarch, the yield of glyoxal tetramethyl acetal was independent of the time of methanolysis from 3 hours onward, provided that the concentration of hydrogen chloride was kept constant. When the time of methanolysis was 16 to 18 hours and the acid content was varied above a certain minimum concentration, the yields of the tetramethyl and the cyclic acetal varied inversely in such a way that the total recovery retained its proper value of about 90 per cent. It is therefore possible that one or more equilibria exist between methylerythroside, glyoxal tetranmethyl acetal, and the cyclic acetal and that the amount of the latter increases with the hydrogen chloride concentration.

Acknowledgment — The authors wish to thank the following organizations for the financial assistance which made it possible to complete the research: the Fundamental Research Committee of Technical Association of the Pulp and Paper Industry, E. I. du Pont de Nemours and Company, the Hercules Powder Company, and the Mathieson Alkali Works.

Effect of Mill Operations on the Number of Bacteria Found in Paper and Paperboard Products

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While control of microorganisms for economic reasons is sometimes considered as quite separate from the type of control that is utilized for the purpose of producing paper and paperboard of low bacteriological content, such a distinction is basically rather tenuous. While, in the latter instance, preventive and control measures are applied more carefully, thoroughly, and systematically, the general procedures and objectives are similar for both purposes. Mills that follow a policy of thoroughness with respect to cleanliness and prevention of microbiological development, are usually successful in materially reducing bacteriological counts in finished products and in avoiding economic losses due to microorganisms. It is generally true that where mills fail to establish effective control over microorganisms, as reflected in high counts of paper or board, they almost invariably neglect or overlook one or more sources of microbiological growth. It has been repeatedly demonstrated, however, that where mills are successful in preventing colonization or build-up of growth at these points, made possible through careful and thorough control procedures, reductions in bacterial counts are obtained with fair consistency.

Several of the largest producers of paper and paperboard used in the packaging or handling of perishable foods, have been working toward the manufacture of essentially sterile products, that is, products which show by standard methods of bacteriological analysis, that viable microorganisms are practically absent or that so few are present as to render accurate counting by plating methods nearly impossible.

The thicker sheets, used for the ends of some containers, have usually yielded somewhat lower counts than body or side wall stock. Differences between low and high caliper boards may be observed among some mills that exercise uniformly good bacteriological control and maintain high quality standards in selection of raw materials. Products from plants that succeed in practically sterilizing their pulps through the use of approved germicides and heat, do not always reveal significant variations.

Studies have been made of the reasons for consistently high or uniformly low bacterial counts in pulp, paper, and paperboard. The operations investigated, which cover fifty mills selected at random, include plants manufacturing groundwood pulp, chemical pulps, newsprint, low grade specialties, book and bond, chipboard, wrappers, and container board for food packaging. The microorganisms that are responsible for high counts in pulp, paper, or paperboard usually come from one or more of the following sources of growth:

1) Raw water supplies

2) White water system

3) Starch in dry form or in suspensions or solutions

4) Fermentable materials used with calender water

5) Calender water boxes containing decomposable materials

6) Raw materials used in processes of manufacture

7) Groundwood stock

8) Pipe lines

9) Places in a system where stock or white water stagnate, as in pockets, elbows, dead ends, or during storage.

Some bleached and unbleached chemical pulps yield bacterial counts of many thousand colonies per gram. Such counts, which may run as high as 200,000 and 400,000 colonies per gram, are usually due to the use of process water containing a

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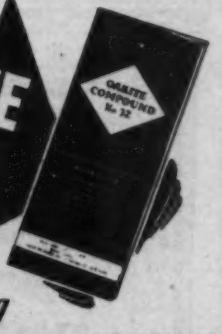

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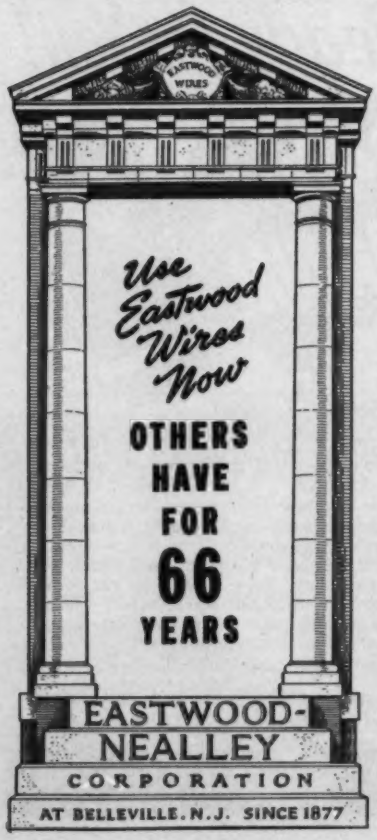

large number of bacteria. These pulps are sometimes relatively free from bacteria but may contain many mold spores and even discoloration or spotting caused by the growth of these organisms.

Groundwood is rich in food substances available to bacteria, yeast-like fungi and molds. Hence, the problems of controlling the growth of microorganisms in groundwood pulp and preventing fermentation processes from taking place, are unusually difficult. Some mills that manufacture groundwood are successful in substantially reducing bacterial counts throughout the entire system, while others not only fail to do so, but transfer to other mills that purchase this pulp, the microbiological growths that develop.

Certain kinds of secondary stock contain a miscellaneous microbiological flora that varies widely in the total number of organisms present. Samples of old news often vary from a few hundred to 2,000 colonies per gram, while mixed waste papers sometimes yield counts of 50,000 to 300,000 colonies per gram.

In cases where fibrous raw materials contain an abundance of microbiological growth, it is necessary to employ germicidal treatments at beaters or beater chests. While, in this way, the number of organisms present in pulp systems can be reduced and their development prevented, it is sometimes impracticable, particularly in the manufacture of chipboard, to establish strict microbiological control. Some chipboard mills are so situated that fairly effective microbiological control can be achieved. It is possible and most desirable for all mills to prevent objectionable contamination of fibrous materials obtained from plants that are in a position to cooperate by employing preventive and sanitary procedures. When microbiological development in pulps utilized by a mill is due to its own carelessness in handling or storage, the situation can usually be more readily remedied.

The majority of the mills that report difficulty in securing satisfactory bacterial counts in finished paper and paperboard either neglect to maintain constant supervision and consistent treatments of raw water supplies or overlook the fact that relatively few aggressive, slime-producing microorganisms in fresh water are capable of multiplying and colonizing in mill systems. Situations such as this tend to nullify the beneficial effect of the other treatments utilized.

The importance of the bacteriological content of calender water to paper and paperboard counts is obvious. Calender water boxes should be kept clean and not allowed to develop slime. Damming materials are sometimes allowed to ferment, producing undesirable odors. Water boxes often contain dirt, fiber, oily residues and waste. The use of contaminated and fermentable solutions at water boxes, such as starch or soapy waxes, is a direct cause of unusually high counts in paper and paperboard. A few mills take whatever precautions may be necessary to maintain low bacterial counts in all calender water utilized. The majority are partly successful in this but fail to properly control the development of microorganisms in all of the calender water boxes used.

In some instances the troubles which mills encounter have their origin in the condition of pipe lines. The situation is often accompanied by difficulties involving stagnation of white water or stock in relatively inaccessible places, dead ends, pockets, elbows, and during storage. Bacteria develop which produce objectionable odors and form products that are deleterious to efficient operation and high quality paper and paperboard.

Storage and handling of recirculated white water produces conditions that frequently result in distribution of microbiological growths throughout the mill. If process water is reused without storage, and is chemically treated to remove microorganisms, these supplies are usually satisfactory. Main storage chest or tanks are, however, a common source of abundant microbiological development. White water picks up growths, as it passes through pipe lines and other parts of a mill system, sometimes consisting of resistant types of microorganisms which persist and finally appear in finished products. Fresh stock receives abundant contamination from such water, initiating or aggravating troubles that often prove serious. If white water containing starch is used in mill processes, the reused water becomes an even greater hazard to satisfactory operation and efficient microbiological control. This water, as well as broke stock containing starch, should receive proper chemical treatment in order to avoid trouble when white water and stock pass through pipe lines and into the mill system. Groundwood white water is an unusually prolific source of microbiological growth and, unless properly handled, presents some unusually difficult problems.

The various factors which influence the survival of microorganisms in pulp, paper, and paperboard under the lethal effects of heat and chemicals employed by mills, are not well understood. It is true that, as the methods used by mills to eliminate microorganisms increase in effectiveness, the flora that remains tends to become restricted to a relatively few heat resistant species and varieties of bacteria. It has been found, however, that where microbiological growths in mills systems are allowed to develop abundantly, a considerable number of miscellaneous types of organisms are able to withstand chemical reagents and even the effects of machine dryers. We have evidence as to the ability of such a flora to persist in pulp suspensions during prolonged exposure to the high temperatures maintained in hot pulp systems—i.e., 65.5 C. (150 Fahr.) to 82.2 C. (180 Fahr.) and also in the finished paperboard produced, which sometimes yields bacterial counts that are between 200,000 and 300,000 colonies per gram.

Under certain conditions, microbiological analyses of paper or paperboard may yield considerable information as to the effectiveness of the control measures utilized by these mills. While the laboratory methods now available for testing finished products are not, in themselves, sufficiently critical to provide all of the essential information in pulp and paper microbiology and plant sanitation, such procedures are helpful in determining, in a general way, the condition of these products and the precautions taken in their manufacture.

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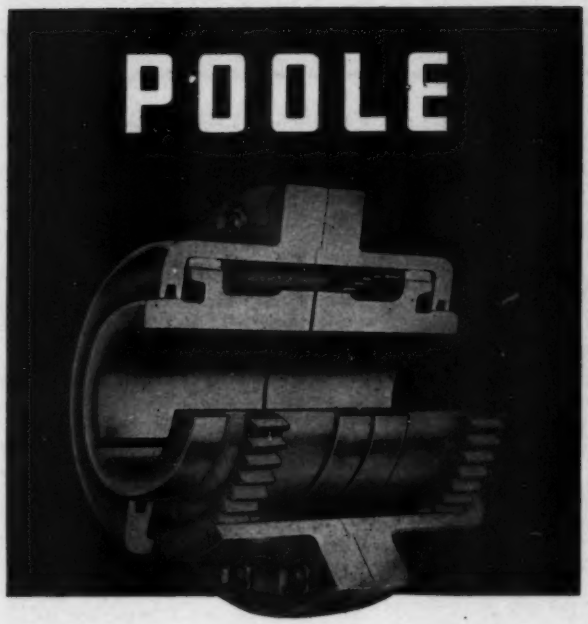

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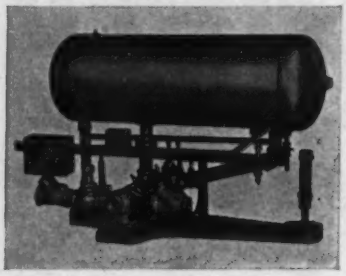
NEW EQUIPMENT AND SUPPLIES

Three-Valve Tilt Trap

A three-valve tilt trap for variable pressures has been announced by the W. M. Acker Organization, Cleveland, Ohio, as an addition to its line of deaerating systems for steam drainage and boiler feeding. The



construction of female trunnion supported on center bearings, and male steam and water ends, relieved of any weight carried on the packing, is the same as that used on the basic Acker return and non-return tilt traps.

Portable Electric Hoist

The Yale & Towne Manufacturing Co., Philadelphia Division, Philadelphia, has announced the *Midget King Electric Hoist.* This hoist, made in ⅛, ¼, ½ and 1

ton capacities and in both a-c. and d-c. models, can be carried around a plant with little effort. A place to hang it and an electric outlet to plug into are all that is required to put it into service.

Air Driven Mixers

Three heavy duty air driven mixers *(Models AY-33, AY-100, AR-100)* have been announced by Mixing Equipment Co., Rochester, N. Y. With a top motor speed of 1800 rpm. in each case, the top speed of mixer shaft of *Model AY-33* is 400; *AY-100,* 431; and *AR-100,* 1800. The respective size of propeller is 8 in., 12 in., and 5 in.; the respective shaft diameter, ⅞ in., ⅞ in., and ⅝ in. Maximum shaft

length for both *Model AY-33* and *AY-100* is 60 in.; of *AR-100,* 48 in. Shaft and propeller materials include stainless steel, plain steel, Monel, bronze, etc.

Ready-Mixed Floor Patch

Flexrock Co., 23rd & Manning Sts., Philadelphia, has announced a ready-mixed floor patching material that enables concrete floor repairs to be made quickly

and the repaired area to be put back in service as soon as the repair job is finished. The product, designated as *Instant-Use Resurfacer,* requires no special skill to apply.

Oil-Resin Emulsion Water Paint

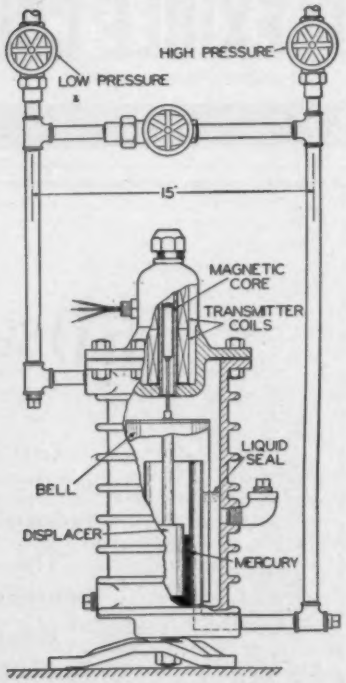
Truscon Laboratories, Caniff and G.T.R.R., Detroit, has announced *Opaltone* as an oil-resin emulsion wall coating that is remarkably washable. Made in eight pastel shades and white, the paint requires no primer or sealer; has no objectionable odor; hides most surfaces in one coat; and may be applied with roller, brush or spray.

Processing Material for Fiber

National Oil Products Co., Harrison, N. J. has announced *Nopco* 2211 as a processing material for use in the cooking of rags, raw cotton fibers, and other fibrous materials for paper. According to the manufacturer, the use of *Nopco 2211* has aided materially in wetting the raw fiber during the loading of the cooker, and in removing naturally occurring impurities such as waxes, pectins, stem particles, and oils which may have been used in textile processes; also, in lessening the reddish stain sometimes present after cooking, in reducing cooking time, and in reducing the amount of chlorine needed for bleaching.

Low Pressure Flow Transmitter

Cochrane Corp., 17th & Allegheny Ave., Philadelphia, has announced a low pressure flow transmitter, the *Style H,* for use in conjunction with standard Cochrane electric meter receiving units. This transmitter is



designed specifically for the measurement of low static pressure gases and for differentials of 2, 4, 6, 8 or 10 inches of water. Ease of accessibility to the transmitter interior permits thorough cleaning of all parts. Standardization of design permits altering the differential by changing displacer and amount of mercury in central reservoir.

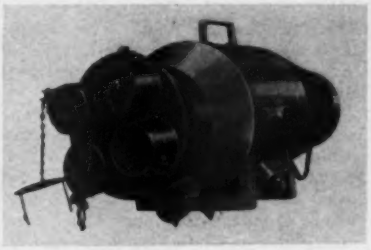
Bulletin Display Cabinet

A bulletin display cabinet, known as the *M. S. A. Tell-Board,* has been announced by Mine Safety Appliances Co., Braddock, Thomas, and Meade St., Pittsburgh. Con-

structed of white pine, Masonite, and glass in an overall size of 32 in. x 25 in. x 3½ in. (inside depth 2 in.), finished in two-tone green enamel, and illuminated by two incandescent lamps mounted inside top of cabinet, the unit is designed for better display of safety and morale posters, instructions and special messages.

Portable Gas Exhauster

Chelsea Fan & Blower Co., Inc., 1206 Grove St., Irvington, N. J., has developed a portable exhauster for use in eliminating gases, fumes, etc., from closed-in places. Weighing only 70 lb. and powered by a

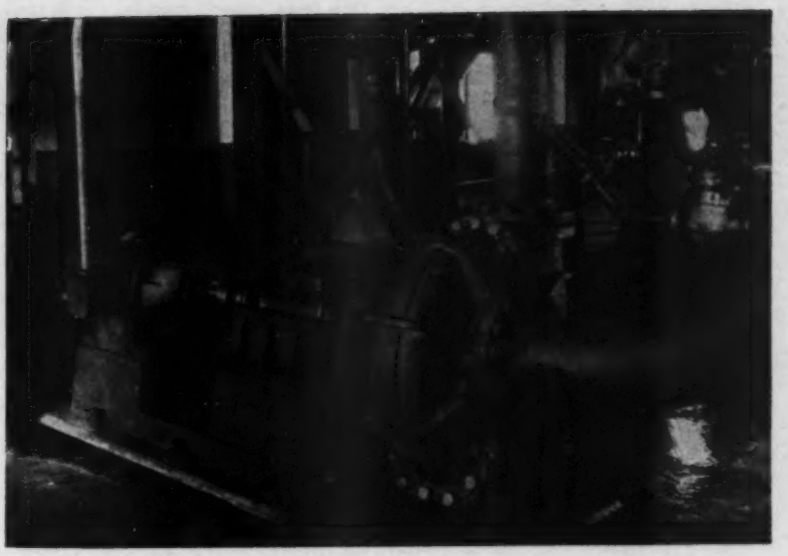


¾-hp. ball bearing equipped motor, the unit sucks or blows 2,000 fpm. The design includes adapters for three 4-in. nozzles or four 3-in. nozzles for flexible hose connection, and caps for closing the nozzles when not in use. The entire unit can be hung into a small manhole.

Pump Tank Fire Extinguisher

American-La France-Foamite Corp., Elmira, N. Y., has announced a new self-contained pump tank fire extinguisher for use on incendiary bomb fires. Made in two sizes, 5 gal. and 2½ gal., the pump

has an over-sized air chamber (assuring minimum pulsation, a steady pressure, and a more constant stream), and a range of 30 to 40 ft. It is equipped with a 26 in. hose. Both sizes are approved by the Underwriters' Laboratories with a Class A-1 rating, under the Emergency Alternate Specifications.



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CENTRIFUGAL PUMPS

TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Cuban Fibers

The possibility of replacing jute in sugar bags by a home-grown fiber (*urena lobata*) is discussed. In marine cordages, bowstring hemp, which may be abundantly cultivated can be used in place of Manila hemp. Evidently it resists rotting by salt water. "Luffa," a fiber used in oil filters in ships and previously imported from Japan, is also grown in Cuba. Sisal hemp (shipped to American factories) is a Cuban product too. Marie L. Blanco—Rayon Textile Monthly 23, No. 10,596 (Oct. 1942).

Tensile Strength and Moisture in Paper

While the water sorption and retention in paper varies with humidity and temperature of the air, the degree of beating is an important factor. Paper made from cotton sorbs the least, and paper from groundwood, the most moisture. Except in the case of samples having 30-120% moisture, the tensile strength is inversely proportional to the moisture content. Water in paper within certain limits may be regarded as a liquid with high viscosity. This does not hold however, after strong pressing. Sulphate (but not sulphite) pulp increases in strength by wet pressing. The maximum tensile strength occurs at a definite moisture content for a strongly beaten pressed pulp. H. Pellinen. Finnish Timber J. 23, No 15, 293 (1941); through C. A. *36*, 6799 (1942).

Mannan and Starch in Paper

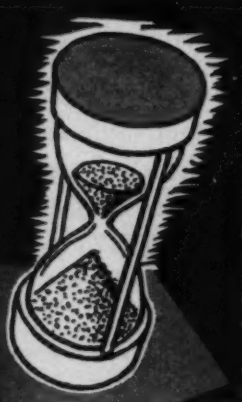
This paper (written in Dutch) deals with the determination of mannan and starch. The latter is found by extracting five grams of the paper sample with 200 ml. water and 5 ml. of glacial acetic acid at the boiling point, filtering, and then hydrolyzing the filtrate for 0.5 hour with 10 ml. concentrated hydrochloric acid, and determining the glucose thus formed.

Under the conditions outlined, mannan does not dissolve, nor is it removed by 30% acetic acid, 4*N* ammonium hydroxide, or 4 *N* NaOH. On the other hand chloral hydrate in water (in the ratio of 8 to 5) dissolves the mannan completely. After concentration of the solution the mannan may be precipitated by ethanol. Adhering rosin may be extracted with ether. J. W. Dijk. Chem. Weekblad 38, 329 (1941) through C. A. 36, 5647 (1942).

Fermentation of Waste Sulphite Liquors

The waste liquors of the Balakhnin sulphite pulp mill were found to be suitable for yeast growth, when it came to ash and organic matter. Interfering substances like sulphur dioxide and furfural could be removed by aeration and by heating. Magnesium carbonate, or a mixture of this with calcium carbonate, or natural dolomite and ammonium carbonate may be used in the neutralization. The best results, as indicated by absence of turbidity, and the preservation of sugars following the neutralization, were obtained with ammonium carbonate. This also obviates the use of ammonium sulphate as nutrient. N. I. Proskuryakov, R. I. Grinberg, and A. S. Nechaeva. Sbornik Nauch-Issledovatel. Robot Sektora Drozhzhevoi Prom. 1939, 56-74; Khim Referat Zhur (U. S. S. R.) 1940, No. 9 40; through C. A. 36, 7302 (1942).

12 WAYS TO ADD LIFE TO YOUR FELTS



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2) Do you examine rolls, boxes, and journals for surface grease and remove at once if found, before attempting to place felt on machine?
3) Have you recently checked felt rolls for balance? For free turning?
4) Is your felt cleaner, particularly those parts touching the felt, in excellent condition?
5) Are you sure that your felt stretchers are operating freely?
6) Do you know if the crowning of your press rolls is correct? Are these rolls in alignment?
7) Are you sure your whipper arms are operating evenly and with correct amount of whip?
8) Are holes in shower pipes open and applying correct spray?
9) Do you check water temperature and insist that correct temperatures be maintained?
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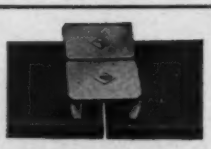

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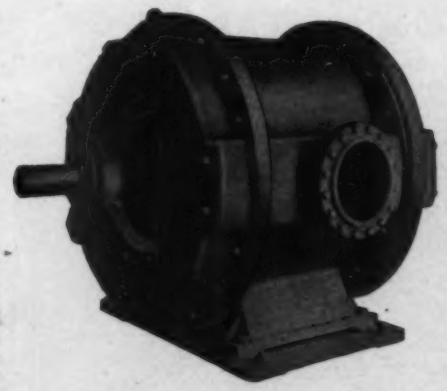

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PAPERMAKING PATENTS

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Inquiries should be addressed to James Atkins, Munsey Building, Washington, D. C.

Coating Machine

Patent No. 2,287,905. Howard B. Richmond, Gilbert K. Dickerman and William F. Thiele, Wisconsin Rapids, Wis., assignors to Consolidated Water Power and Paper Company, Wisconsin Rapids, Wis., a corporation of Wisconsin. Application January 8, 1941, Serial No. 373,566. 8 Claims. (Cl. 91—48). A device for coating paper which comprises in combination, a frame, a pair of rolls supported adjacent their ends in said frame, said rolls having their axes horizontally disposed in vertical alignment with the opposed surfaces adjacent each other, means for passing a flexible web between said roll surfaces, a pair of rolls positioned adjacent the lower portion of said frame, said rolls having their axes in substantially horizontal alignment, the opposed surfaces of said last mentioned rolls being positioned adjacent each other to provide a nip for holding coating material, dams carried at the ends of said nip to prevent loss of coating material from said nip, one of said last mentioned rolls being positioned beneath said first mentioned rolls in supporting relation thereto, said supporting roll being of relatively larger diameter than said first mentioned rolls whereby to substantially prevent excess deflection of said first mentioned rolls, said supporting roll being adapted to transfer coating material to one of said first mentioned roll surfaces whereby said coating material is applied to a surface of said web.

Fourdrinier Wire Stringing Device and Method

Patent No. 2,290,087. Earl E. Berry and Lloyd Hornbostel, Beloit, Wis., assignors to Beloit Iron Works, Beloit, Wis., a corporation of Wisconsin. Application January 6, 1938, Serial No. 183,629. 11 Claims. (Cl. 92—44). In combination with a paper making machine having a laterally removable table structure and a cantilever type couch roll, means for stringing a Fourdrinier wire into an open loop adjacent the table structure for receiving said structure therein, wish-bone members attachable to the couch roll end of the table structure, pole brackets at the ends of said wish-bone members for receiving wire poles supporting the wire in an open loop whereby the table structure can be run into the open loop of the Fourdrinier wire, the wish-bone members attached to the table structure, the wire poles supporting the couch roll end of the wire transferred to the wish-bones, and the table structure with the wire thereon moved back into the line of the machine with the wish-bone members holding the wire in space relation around the couch roll.

Paper Manufacture

Patent No. 2,289,686. Brainard E. Sooy, Middletown, Ohio, assignor to The Gardner-Richardson Company, Middletown, Ohio, a corporation of Ohio. Application July 7, 1939, Serial No. 283,230. 16 Claims. (Cl. 91—51). An apparatus of the character described for applying a surface coating material having a volatile constituent to a web of paper material comprising a fountain for receiving a quantity of said coating material, means for continuously feeding coating material from said fountain toward said paper web and for applying said coating material under predetermined pressure as a thin film on the surface of said paper web, means for controlling the evaporation of said volatile constituent to thereby provide for applying a surface coating substantially uniform transversely and lengthwise of the paper web including supply means for introducing said coating material into said fountain, and means for controlling the operation of said supply means to effect the introduction of only such quantity of the coating material as will be applied to said paper web within a predetermined limited period of time.

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THAT'S RIGHT, JUNIOR—SAVE THE PIECES. They may or may not be used finally, but your idea is sound. *Save copper and steel!* Here at Lindsay we are putting forth an extreme effort to make every pound of metal go as far as it possibly can, and at the same time to give you the finest Fourdrinier wires in our history. Somehow, the two procedures supplement each other.

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Serving the Paper Industry Since 1903
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Lindsay **WIRES**

New Catalogues, Publications, and Ass'n Reports

American Pulley Co., Philadelphia—This company's new American Econ-O-Matic Drives catalogue has recently been released. Written with the Government's program to conserve critical materials in mind, the catalogue is very timely, containing suggestions for obtaining the utmost service from hard-to-replace equipment and for speeding up production. It deals with both V-belt and flat-belt drives, and includes data on motor base mountings for special applications. Photographs and case histories of typical power-transmission installations are featured. Blueprints, drive selection tables, and dimension tables are included for handy reference and comparison. Copies are available.

Cochrane Corp., Philadelphia—This company is offering reprints of an article by Austin C. Dresher entitled, "Conditioning Feedwater for High-Pressure Boilers," which was published in *Power Plant Engineering*. The paper is a resume of the art of feed water conditioning written in plain language, easily followed and understood by operating engineers.

Economy Pumps, Inc., Hamilton, Ohio—This company's new Type SCV Pump is described in detail in Catalogue D2-1042, just off the press. Diagrams and illustrations are included. Among the services suggested for the SCV pumps are cold water circulation, hot water circulation, brine circulation, air conditioning systems, sprinkler systems, pump units for boiler feeding, pressure boosting and washing machinery.

Graver Tank & Mfg. Co., Inc., East Chicago, Ind.—Bulletin 314 describes Graver hot process softeners. This type water softener conditions the water in a way that removes undesirable compounds and elements such as temporary and permanent hardness, suspended solids, and silica. The system consists essentially of a sedimentation tank, a series of pressure filters, and chemical mixing and proportioning equipment, together with the necessary pumps, piping, and valves, and the entire process is thoroughly covered in the bulletin, copies of which will be sent upon request.

Labor Relations Institute, New York City—A manual for employers, personnel directors, and labor relations men on how to apply the new Wage Stabilization Act has just been released by the Labor Relations Institute. The handbook, "Practical Questions and Answers on Wage Stabilization," is the second in a series of publications resulting from surveys on current employer-employee problems conducted by the Institute's field staff. It is a compilation of the wage stabilization questions which are proving most troublesome to management executives. Details of the kind of raises which may be given as well as the types of increases which have been disallowed by the new orders are included. For copies write to Lawrence Stessin, Direction, Industrial Division, Labor Relations Institute, 1775 Broadway, New York City.

Leeds & Northrup Co., Philadelphia—"Micromax Frequency Records and Indicators" are described in a 20-page catalogue just issued by this company. Equipment used in central stations and in industrial power plants to enable power producers to effect substantial economies in system regulation is pictured and described. For a copy of this catalogue, No. N-57-161, write to this company, 4934 Stenton Avenue, Philadelphia.

J. T. Ryerson & Son, Inc., Chicago—A new booklet on NE (National Emergency) steels has just been published by this company. NE steel was announced during the 100th anniversary year of Ryerson. The book deals with the selection and heat treating of NE steels. It is readily understandable, and contains a careful step-by-step explanation of the Jominy End Quench Hardenability Test, a quick method of determining the heat treatment response. Four tables for converting Jominy Test results into tensile strength, yield point, elongation, reduction of area, etc., are also included. Copies available upon request.

Books

The Organization and Training of Industrial Fire Brigades—Written in simple, non-technical language, this book has been compiled by experienced fire officers as a text for a thirty-hour course of training in the fundamentals of fire-fighting. It contains over 150 clear-cut drawings which illustrate every part of the text, thereby making it possible for those taking the course to perform a useful function in the event of fire. This book has received the endorsement and recommendation of some of the foremost authorities in the fire-fighting field, and it is now being used as a text book in organized fire training activities by both large and small establishments throughout the country. The regular price of the book is $1, however, a special quantity discount is offered to those organizing private fire brigades from among their own employees. The publisher is S. C. Toof & Co., 195-201 Madison Ave., Memphis, Tennessee.

Industrial Guard's Manual — Harry Desmond Farren, the author of this volume, states in its foreword that the prevention of sabotage, malicious mischief, and the prevention of crippling accidents to life and property are among the guard's major tasks; that he must be a man of keen intelligence, good judgment, and calm purpose; and that the guard, of whom it is said, "He suspects everyone and everything," is a guard worthy of the trust placed in him. The book is divided into eight chapters: namely, Public and Worker Contact; Riots, Panics, Mobs and Crowd Behavior; Self-Protection; First Aid; Fire Protection; Sabotage and Espionage; Plant Protection; and Bombs and Infernal Machines. Consisting of approximately 100 pages, having a very convenient page size, and bound attractively in a semi-flexible brown cover, the book is priced at $1.25 per copy (special discounts in quantity orders) by the publisher, National Foremen's Institute, Inc., Deep River, Conn.

Association Reports

All of the orders which affect the industry emanate from the OPA and WPB and clear through the office of E. W. Tinker, executive secretary of the American Paper and Pulp Association. Copies of all government orders are sent by the Association to members. Listed below are releases sent out during December by the APPA. Any correspondence with that office regarding these releases should carry identifying listing and numbers under "Legislation and Public Affairs."

National Defense No. 245—M. P. R. 30—Wastepaper (Revising Price Schedule No. 30—Wastepaper—As Amended).

National Defense No. 251—Priorities Regulation No. 10—Controlled Materials Plan.

National Defense No. 252—The Control of Paper Order, 1942, made by The Minister of Supply of the British Government.

National Defense No. 255—Maximum Price Regulation No. 129. Collation No. 2, which includes amendments up to and including No. 8. In addition, amendments 9, 10, 11, 12, and 13, which brings this regulation up to date.

Recondition for Salvage and Wartime Maintenance!

MAGNUS TECHNICAL BULLETIN
No. 74
REPAIR, MAINTENANCE and CONSERVATION of PAPER MILL EQUIPMENT
MAGNUS CHEMICAL COMPANY Garwood, N. J.

More than ever, it's up to the paper mill to set up carefully planned programs for cleaning and reconditioning because of shortages of critical metals and other materials. Pipe and piping, machine parts and accessories, felts and every other possible working or laid-up equipment in the mill should be cleaned either for salvage, future repairs or replacements—or for better maintenance and high-speed production.

MAGNUS CLEANERS FOR RECONDITIONING

together with suggested methods of use adapted to these times of war are covered in great detail in this new technical bulletin No. 74.

You will find the data it contains to be practical and immediately useful. Cleaning and reconditioning of pipe and piping; machines of all kinds; suction press rolls; felts; fuel oil storage tanks and systems and all other mill equipment are covered in detail.

Write now for your copy.

THIS BULLETIN IS FULL OF PRACTICAL IDEAS THAT CAN SAVE YOU PLENTY AND AVOID PRODUCTION DELAYS.

MAGNUS CHEMICAL COMPANY

Manufacturers of Cleaning Materials, Industrial Soaps, Metallic Soaps, Sulfonated Oils, Emulsifying Agents and Metal Working Lubricants.

192 South Avenue Garwood, N. J.

MAGNUS CLEANERS

KNIFE GRINDING

THE VALUE OF *proved* SUPERIOR SERVICE

For Doctor Blades and Paper Knives

The *promise* in the earlier design of the models here shown, has now become the *established standard* in the latest development of these machines, for strictly precision grinding, keen edge finish, wet or dry grinding of slitter knives, paper knives, doctor blades, barker knives, chipper knives, and all straight or bevel edge grinding, and universal slitter knife service.

• • •

Superior, *proved*, service was never better exemplified than in these two machines, definitely establishing the better grinding standards for slitter knives, paper knives and doctor blades, which are now becoming the standards of the industry through the development and wide adoption of these machines.

Superior, economical, proved. Developed by the pioneers in the industry. Complete catalogue sent free upon request.

For Slitter Knives

COVEL-HANCHETT CO.—Big Rapids, Mich., U.S.A.

Until the war is over KEEP YOUR EQUIPMENT IN GOOD OPERATING CONDITION

Now — it's all out efforts to win the war — a real tough war. Our facilities are needed for war equipment. Make your present equipment do the utmost in production.

Check equipment frequently to see that it is in good operating condition.

Parts that wear out, replace at once.

Ask our engineers to help you get the most out of Murray equipment in your mill.

D. J. MURRAY MFG. CO.
WAUSAU, WISCONSIN

BELT LACING and FASTENERS for transmission and conveyor belts

"JUST A HAMMER TO APPLY IT"

ALLIGATOR

Trade Mark Reg. U. S. Pat. Office

STEEL BELT LACING

World famed in general service for strength and long life. A flexible steel-hinged joint, smooth on both sides. 12 sizes. Made in steel, "Monel Metal" and non-magnetic alloys. Long lengths supplied if needed. Bulletin A-60 gives complete details.

FLEXCO HD

BELT FASTENERS AND RIP PLATES

For conveyor and elevator belts of all thicknesses, makes a tight butt joint of great strength and durability. Compresses belt ends between toothed cupped plates. Templates and FLEXCO Clips speed application. 6 sizes. Made in steel, "Monel Metal", non-magnetic and abrasion resisting alloys.

By using Flexco HD Rip Plates, damaged conveyor belting can be returned to satisfactory service. The extra length gives a long grip on edges of rip or patch. Flexco Tools and Rip Plate Tool are used. For complete information ask for Bulletin F-100.

Sold by supply houses everywhere

"CONVEYOR BELTS EASILY FASTENED"

FLEXIBLE STEEL LACING CO.

4606 Lexington St.
Chicago, Ill.

CURRENT MARKET QUOTATIONS

RAGS (Domestic)
f.o.b. New York City

NEW RAGS — *per cwt.*

Blue Overalls	5.25 to 5.50
Corduroy	2.75 to 3.00
Cottons—	
Washables, No. 1	2.85 to 3.10
Fancy Percales	4.25 to 4.50
New Soft Blacks	3.50 to 3.75
New Light Seconds	2.05 to 2.85
New Dark Seconds	2.40 to 2.60
Khaki Cuttings—	
Mixed	2.75 to 3.00
O. D.	3.25 to 3.50
New White Canvas	6.25 to 6.75
New Mixed Blacks	2.75 to 3.00
Shirt Cuttings—	
New White No. 1	6.25 to 6.50
Silesias No. 1	5.00 to 5.25
New Unbleached	6.50 to 6.75
Fancy	3.50 to 3.75
Linen Cuttings—	
White	14.75 to 15.25
Grey	14.50 to 15.00

RAGS (Domestic)
f. o. b. New York City

OLD RAGS

OPA ceiling prices in sales to consuming mills f. o. b. cars at points of shipment, with brokers' allowances of $1 to $2 a ton depending on the value of the grade involved.

	per ton
Roofing—	
No. 1	31.00
No. 2	29.00
No. 3 and No. 4	27.00
Twos and Blues—	
Repacked	44.00
Thirds and Blues—	
Repacked	44.00
Miscellaneous	36.00
Whites, No. 1—	
Repacked	76.00
Miscellaneous	64.00
Whites, No. 2—	
Repacked	58.00
Miscellaneous	53.00

RAGS (Foreign)
ex dock New York City

NEW RAGS — *per cwt.*

New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)
ex dock New York City

OLD RAGS — *per cwt.*

No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shoppers	

ROPE and BAGGING
f. o. b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	Nominal
Domestic	3.75 to 4.00
Wool Tares—	
Light	3.75 to 4.00
Heavy	4.00 to 4.25
No. 1 Scrap Bagging	3.50 to 3.75
Manila Rope—	
Foreign	—
Domestic	*115.00-
New Burlap Cuttings	5.75 to 6.00
Jute Threads—	
Foreign (Nom.)	6.25 to 6.75
Domestic	5.50 to 6.00
Strings—	
Sisal	4.00 to 4.25
Soft Jute	4.50 to 4.75
Mixed	1.25 to 1.50

*OPA ceiling price per ton f. o. b. shipping point.

WASTE PAPER
F. O. B. New York City

	per ton
Shavings—	
White Env. Cuts, One-Cut	67.50-
Hard White Env. Cuts	62.50-
Hard White, Unruled	57.50-
Soft White, One-Cut	57.50-
Soft White, Misc.	43.00-
Fly Leaf, No. 1	33.50-
Fly Leaf, Woody, No. 1	25.00-
No. 2 Mixed Col. Woody	18.00-
Flat Stock—	
No. 1 Heavy Magazines	37.00 to 38.00
Mixed Books	15.00 to 16.00
Ledger Stock—	
No. 1 White	42.50 to 43.50
No. 1 Mixed (Colored)	36.50 to 37.50
Manilas—	
New Env. Cuttings	52.00-
New Env. Cuts, One-Cut	57.50-
Extra Manilas	37.00-
Manila Tab Cards, Free of Ground Wood	45.00-
Ground Wood Manila Tab Cards	27.00-
Kraft—	
Envelope Cuttings	35.00-
Mixed Env. or Bag Cuts	35.00-
Tripled Sorted No. 1 Brown	50.00-
New 100% Cor. Cuts	45.00-
No. 1 Old Assorted	33.00 to 34.00
News—	
White Blank	23.00-
Overissue	16.00 to 17.00
No. 1 Baled	14.00 to 15.00
Old Kraft Corrugated Containers	30.00-
Old Corrugated Boxes	15.50 to 16.50
New Corrugated Cuts	17.00 to 18.00
Mill Wrappers	11.00 to 12.00
Box Board Chips	7.00 to 8.00
No. 1 Mixed Paper	7.00 to 8.00

CHEMICALS
f. o. b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.25-
Ground, cwt.	4.00-
Powdered, cwt.	4.40-
Blanc Fixe—	
Pulp, bulk, ton	40.00 to 46.50
Dry, barrels, pound	60.00 to -
Bleaching Powder—	
Drums, cwt.	2.25 to 3.10
Casein (Domestic Standard)—	
20-30 mesh (bags), lb.	19.00 to 20.00
80-100 mesh (bags), lb.	19.50 to 20.50
Argentine, lb.	—
China Clay—	
Domestic Filler Bulk (mine) ton	7.50 to 15.00
Domestic Coating Bulk (mine) ton	12.00 to 22.00
Imported (ship side) Bulk (lump) ton	15.00 to 26.00
Chlorine—	
Tank cars (wks) cwt.	2.00 to 2.25
Gelatine (silicin), lb.	.90 to .95
Glyc. (C.P.) drums, lb.	18.25 to 18.75
Litharge, powd., bbl., lb.	.09 to -
Rosin (Gum)—	
New York, per 100 lbs.	
E	3.80-
F	3.90-
G	4.05-
WW	4.40-
Rosin (Wood), carlots	3.05-
Salt Cake—	
Dom. bulk (wks) ton	15.00 to 16.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	20.00 to
Soda Ash—	
Bulk (works), cwt.	.90 to .95
Paper Bags, cwt.	1.05 to 1.35
Barrels, cwt.	1.05 to 1.35
Soda (Caustic)—	
Solid, drums, cwt.	2.30 -
Ground and flake, drums, cwt.	2.70 -
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg., 35 gal. drums, (works) cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	3.10-
Pearl, barrels, cwt.	3.20-
Paper (Sp.) bags, cwt.	3.20-
barrels, cwt.	3.30-
Sulphur (crude)—	
(mine) bulk, long ton	18.00 to 20.50
Talc—	
Dom. 100 lb. bags (mine) ton	16.00 to 21.00
Imp. bulk, ton (Nom.)	—
Titanium Dioxide—	
Barium Pig., bbls., lb.	.05¾ to .08
Calcium Pig., bbls., lb.	.05 to .05¾
Zinc Sulphide, bbls., lb.	.08¾ to .08½

WOOD PULP

OPA maximum prices applicable to wood pulp delivered to consumer mills located East of the Continental Divide exclusive of Denver, Colo.:

Bleached softwood sulphite	76.00
Unbleached softwood sulphite	66.00
Bleached hardwood sulphite	73.50
Unbleached hardwood sulphite	63.50
Bleached Mitscherlich sulphite	61.00
Unbleached Mitscherlich sulphite	72.00
Northern bleached sulphate	86.00
Southern bleached sulphate	79.00
Northern semi-bleached sulphate	82.00
Southern semi-bleached sulphate	75.00
Standard news print siderurus	46.00
Northern unbleached sulphate	73.00
Southern unbleached sulphate	63.50
Bleached soda pulp	66.00
Unbleached soda pulp	62.00
Ground wood pulp	46.00
Sulphite screenings	38.50
Sulphate screenings	38.00
Ground wood screenings	30.00
Northern unbleached sulphate siderurus	73.00
Southern unbleached sulphate siderurus	63.50

PAPER
f. o. b. New York City

	per ton
Boards—	
Binders	84.50-
Chip	45.00-
Chip, sgl. mla. lined	60.00-
Coated, white patent .016	80.00-
.020 and heavier	75.00-
Kraft liner	80.00-
News	45.00-

	per cwt.
Book (eased)	
No. 1 Coated	15.50-
No. 2 Coated	14.00-
No. 3 Coated	13.25-
No. 4 Coated	12.75-
No. 2 Offset	11.00-
A Grade Super	10.75-
B Grade Super	10.25-
Bonds (Rag Content)—	
100% Rag Ext. No. 1	42.50 to 46.00
100% Rag	35.00 to 37.75
85% Rag	
75% Rag	25.00 to 27.00
65% Rag	
50% Rag	20.80 to 22.75
25% Rag	18.20 to 20.00
Regular Colors	1.00 cwt. extra
Bonds (Sulphite)—	
No. 1	11.70-
No. 2	10.75-
No. 4	9.90-
Colors	1.00 cwt. extra
Glassine (f. o. b. mill)—	
Embossed (25 lb. up)	13.75 to 14.25
Bleached (25 lb. up)	12.75 to 13.25
Unbleach. (25 lb. up)	11.50 to 12.00
Greaseproof—	
Bleach. (25 lb. up)	11.00 to 11.50
Unbleach. (25 lb. up)	10.00 to 10.50
Ledgers (Rag Content)—	
100% Rag Ext. No. 1	41.40 to 48.50
100% Rag	36.25 to 39.25
85% Rag	32.20 to 37.75
75% Rag	26.25 to 28.00
65% Rag	22.80 to 27.75
50% Rag	22.10 to 24.25
25% Rag	19.50 to 21.50
Regular Colors	1.00 cwt. extra
Ledgers (Sulphite)—	
No. 1	13.60-
No. 2	12.05-
No. 4	11.20-
News—	
Rolls (Contract)	50.00-
Rolls (Spot)	(nominal)
Sheets	58.00-
Tissues (Carlots)—	
White, No. 1	1.10 to 1.20
White, No. 2	1.00-
Bleached Anti-Tarnish	1.15-
Colored	—
Anti-Tarnish Kraft	.70-
Manila	.90 to .95
Napkins, semi-crepe (12½ lb. to M shts.) per ea.	.60-
Napkins, full crepe and emb'sed (12½ lb. to M shts.) per ea.	.60-
Toilet, Bleached (M shts.) per ea.	5.65-
Toilet, Unbleached (M shts.) per ea.	4.25-

	per case
Towels—	
Bleached	3.20 to 3.75
Unbleached	2.60 to 3.05

	per cwt.
Wrappings (Kraft)—	
Extra Quality	5.75-
Super-Standard	5.00-
No. 1 Wrapping	4.75-
Standard Bag	4.12½-

Wrappings (Sulphite and Bleached Kraft)—
(Rolls, f. o. b. mill)

	per cwt.
Bleached papers—	
M.F. & M.G. Waxing, 20 lb. (Carloads only)	7.25 to 7.50
(10,000 lbs.)	7.50 to 7.75
Drug wrapp. 35 lb.	7.00 to 7.25
Unbleached Papers—	
Com. Grd. Butch. 40 lb.	5.50 to 5.75
No. 1 Butchers	5.75 to 6.00
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.25 to 6.50
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite 30 lb.	6.00 to 6.25
Steam Finish, 50 lb.	5.00 to 5.25
Water Finish, 40 lb.	5.50 to 5.75

Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	6.00 to 6.25
Envp. Mla., Sub. 16-28 (No. 2)	5.75 to 6.00
Envp. Mla. (Prices based on large sheets untrim'd reamarked, in bdls.)	
Wrapp. Mla. 35 lb. up—	
No. 1	6.00 to 6.25
No. 2	5.75 to 6.00
M. G. Sulphite and Kraft (other than Waxing)	
Grade A-32 lb.	7.20 to 7.40
Grade B-30 lb.	6.75 to 7.00

WAR OR NO WAR

Awarded Bauer Bros. Sept. 4, 1942

Every pulp and paper mill should understand that the BAUER DOUBLE DISC PULPER will convert various rejects and screenings into valuable and salable products.

Economical recovery of waste materials is important
— ANYTIME —

Write or Wire

The BAUER BROS. CO.
SPRINGFIELD, OHIO

CHEMIPULP PROCESS INC.

CHEMICAL PULPING PROCESSES

Hot Acid Cooking and Recovery Systems
Chemipulp--K-C Digester Circulating Systems with Chip Distributor and Full Automatic Controls

●

Chemipulp--K-C Improved Acid Plants
Gas Fortifying High Acid Concentration

●

Digester Waste Liquor SO_2 Gas & Heat Recovery
Chip Pretreatment Preparatory to Cooking

●

500 Woolworth Building, WATERTOWN, N. Y.
3311 First Avenue South, SEATTLE, WASH.

- Associated with -

CHEMIPULP PROCESS LIMITED
403 Crescent Building, Montreal, P. Q.

TOUGH!
●SWW bed plates and beater bars are the kind you can install and forget. They're built for service . . . last longer between replacements. Standard and special patterns.
THE SIMONDS WORDEN WHITE CO., Dayton, Ohio
SWW
BEATER
TACKLE

TILE CHESTS *Built to Your Requirements*

Kalamazoo tile chests can be built to your exact requirements for stock storage and bleaching. The vitrified glazed tile, made in our own tile plant, is impervious to all ordinary stock fluids and is suitable for storage of liquid alum. The smooth surface is cleaned easily and quickly with hose. Your installation can be designed for adaptation to pump delivery and agitation of any type. Our manufacturing facilities and years of experience with the paper industry are geared for immediate attention to your individual requirements. Write for complete information about prompt delivery and carefully supervised installation.

So satisfactory was the first 37-foot Kalamazoo Glazed Tile Chest installed for the Sorg Paper Company, Middleton, Ohio, that they have recently added two more. All are adapted for Shartle Bros. "Agi-Flow".

BUY WAR BONDS

GLAZED TILE

KALAMAZOO TANK & SILO CO.

KALAMAZOO, MICHIGAN

WOOD

CONTINUOUS PUMPING OF HIGH CONSISTENCY STOCKS WITHOUT CLOGGING, WITHOUT SHUTDOWNS

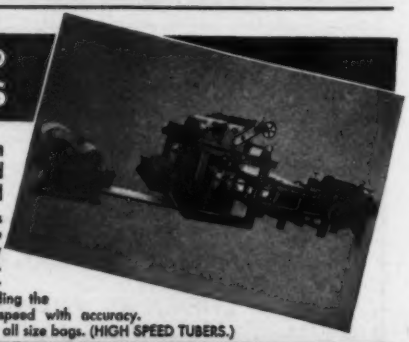
Your **FREDERICK** pump handles high density stock with the greatest of ease, meets your operating needs perfectly . . . because **FREDERICK** pumps are *engineered specifically for such job.* And, your **FREDERICK** pump is *guaranteed* to meet the operating conditions for which it is sold!

Ask about it.
No obligation whatsoever.

FREDERICK PUMPS

The FREDERICK IRON & STEEL CO.
Frederick, Maryland

HIGH SPEED TUBERS



Two-Wall Side Seam Tuber with Patented Side Register Control

For flour or other types of paper bags — single or two-wall — all rotary motion and double cutoff. The Patented Photo-electric Eye Control for guiding the the outer sheet. High speed with accuracy. Tubers and Bottomers for all size bags. (HIGH SPEED TUBERS.)

THE SMITH & WINCHESTER
Manufacturing Company
SOUTH WINDHAM ★ CONNECTICUT

J. W. HEWITT MACHINE CO., Inc.
NEENAH, WISCONSIN

Builders of
Paper Making Rolls and Special Machinery
Roll Grinding a Specialty

NOW READY! NEW EDITION FOR 1942!

The Paper Makers' Directory of All Nations

The Red Book of the British Paper Industry
Alphabetically arranged—Printed in Clear Type
Demy octavo—Cloth bound.
Price 25/—net, or Post Free 27/—Sterling.

DEAN & SON, Limited
30 Bedford Street, Strand — London, W. C. 2, England

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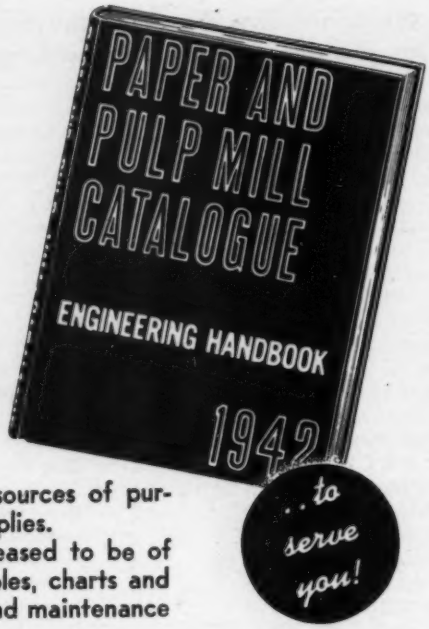

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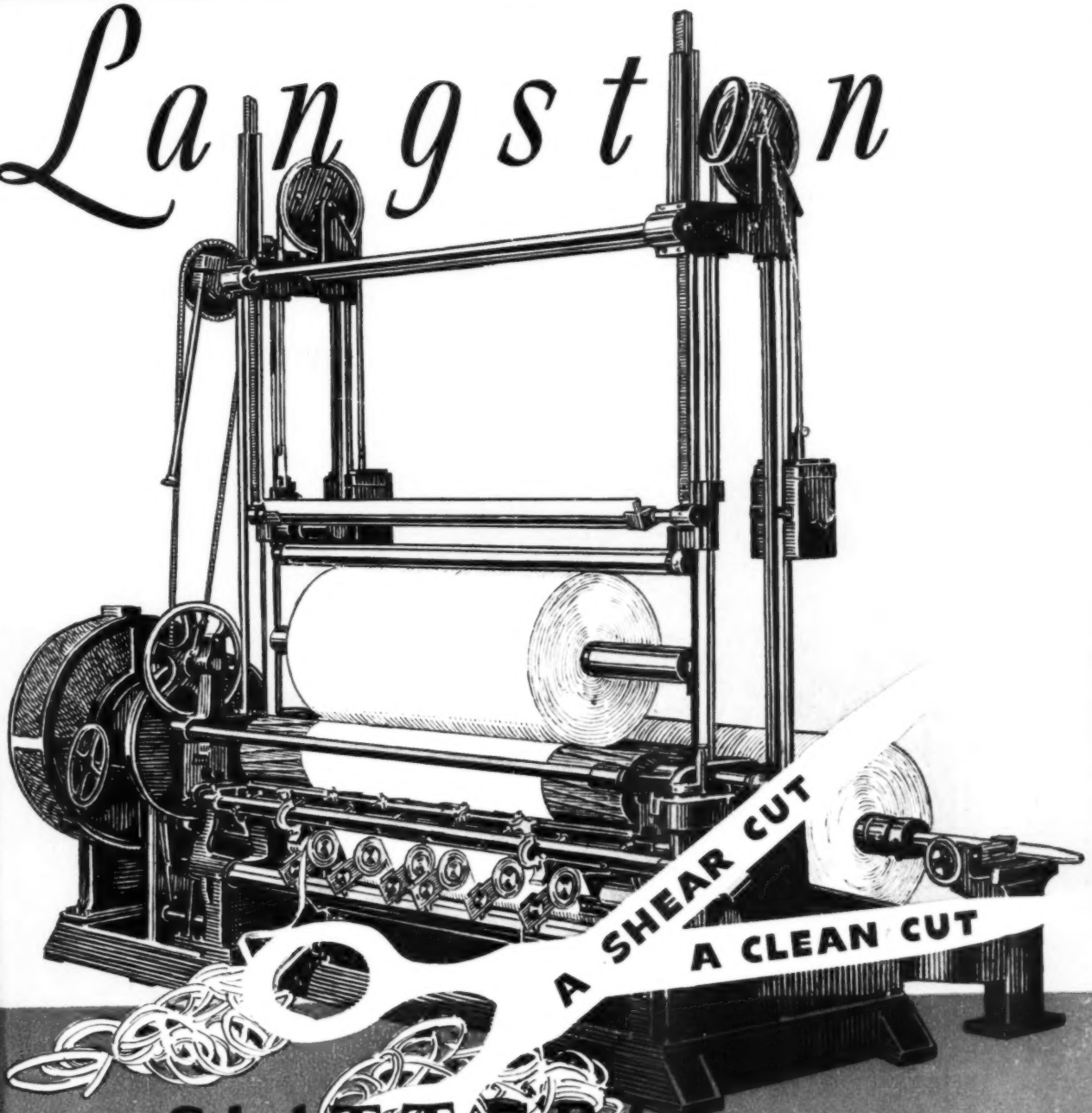

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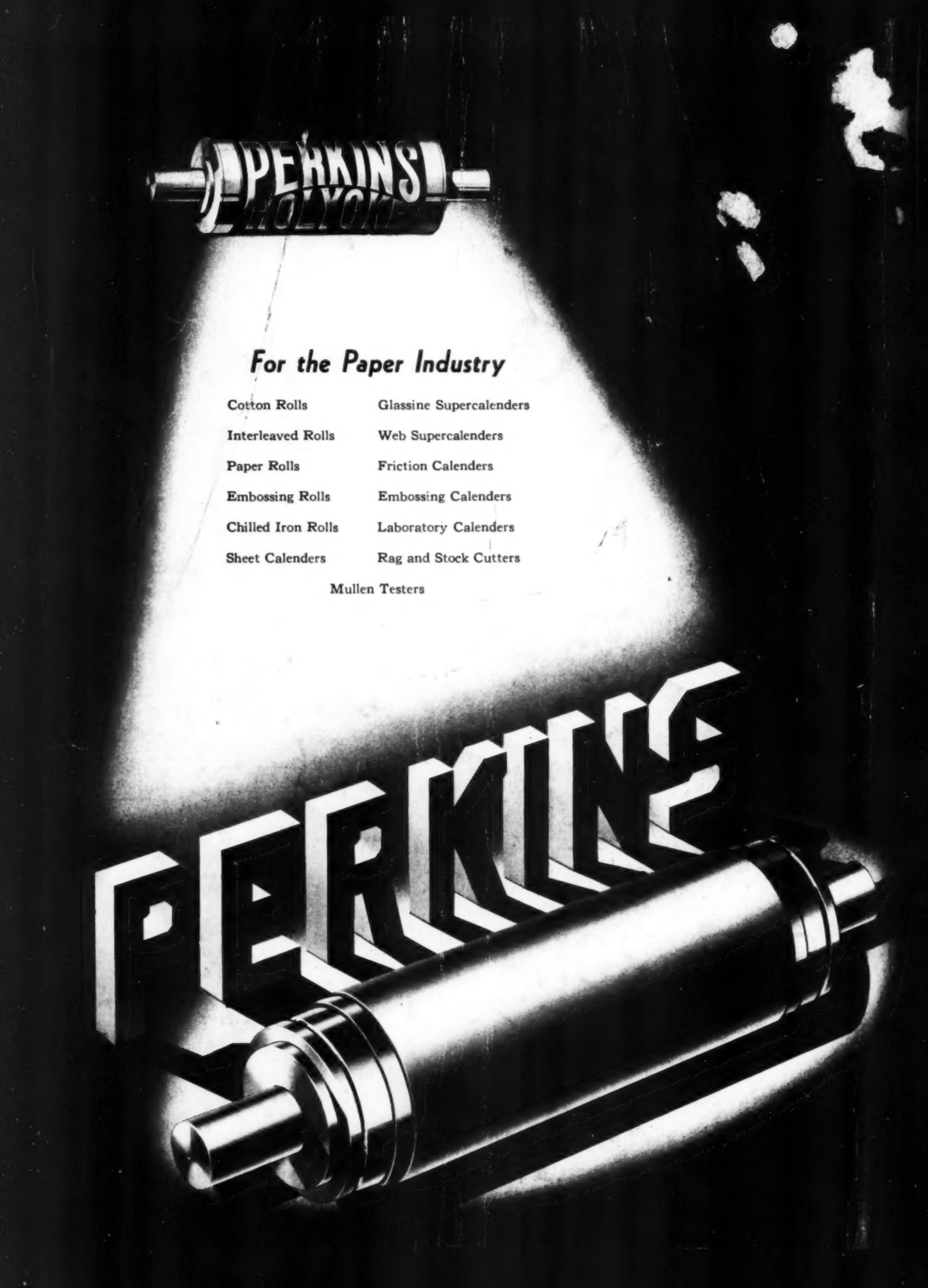
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